IDG.net

MICROSOFT LAUNCHES WINDOWS XP THIS WEEK: How secure is it? PAGE 50 What's really new? PAGE 52

COMPUTERWORLD

THE NEWSPAPER FOR IT LEADERS • WWW.COMPUTERWORLD.COM

OCTOBER 22, 2001 • VOL. 35 • NO. 43 • $5 COPY

AIR SECURITY MAY REQUIRE IT OVERHAUL

Mainframe systems would struggle to perform functions feds are considering

BY JENNIFER DISABATINO

The U.S. Department of Transportation is considering recommendations that could impact performance of the industry's aging mainframe systems and require a costly overhaul.

Some of the DOT's recommendations call for the airlines' IT systems to perform event-based functions, like red-flagging a suspected terrorist's name in a reservation system. While functions like that are relatively simple procedures in a relational database, the databases used by existing airline reservation systems can't perform them. And adding the capability to screen passenger names could cause bottlenecks that would bring the airlines' networks almost to a halt, according to industry experts.

American Airlines Inc., Delta Air Lines Inc., United Air Lines Inc., Southwest Airlines Co. and Northwest Airlines Inc. all declined to comment for this story, saying only that they wouldn't publicly discuss anything related to security.

Secretary of Transportation Norman Mineta's Rapid Response Team on Airport Security issued a report Oct. 1 that recommended, among other measures, a nationwide program of voluntary prescreening of passengers.

The problem is that mainframe-based reservation systems were "never designed to respond to high-speed automated relational queries driven by hundreds of millions of users," said Richard Eastman, president of The Eastman Group Inc. in Newport Beach, Calif., in a soon-to-be published report.

Forty years ago, IBM developed the transactional reservation databases that most airlines still use. This mainframe system is based on Transaction Processing Facility, which constitutes the technology under-

Air Security, page 69

E-SIGNATURES SLOW TO GAIN GROUND

One year later, legal issues, tech stall effort

BY JAIKUMAR VIJAYAN

Corporations looking to implement electronic-signature networks face formidable challenges related to technology and process standards, consumer protection requirements and conflicting state and federal regulations, say users and industry representatives.

As a result, one year after the Electronic Signatures in Global and National Commerce Act went into effect, use of e-signatures for e-commerce is well below expectations, they said.

"Adoption by industry has

E-Signatures, page 12

ANTHRAX THREAT EXPOSES IT ILLS

Doctors: Public health infrastructure isn't ready

BY BOB BREWIN

The anthrax crisis has exposed a national public health IT infrastructure that's seriously ill-prepared to deal with such an emergency.

In fact, that infrastructure is so antiquated that the Centers for Disease Control and Prevention likened it to a "pony express" system that relies on paper-based reports and phone calls in a world driven by the speed of the Internet.

Despite years of warning about the possibility of bioterrorism, when the first incident was reported on Oct. 4, only half of the country's 59 state and territorial health departments and 6,000 state and local health departments and boards had full-time Internet connec-

Anthrax, page 14

Techno-MBA Elite



Don't expect to be awash in technology training in a techno-MBA program. Even in a school where technology is stressed, the focus is on providing "the tools to drive strategic thoughts to manage a business," says Purdue's Chuck Johnson (above).

COMPUTERWORLD'S 4th Annual TECHNO-MBA SURVEY

Story begins on page 26.

NEWSPAPER

8EXEBJFT8 8888888CNR-RT LOT#HB-052
848186UIZ304PB005# OCT 01 804 9158
U M I 120
PO BOX 904 38-4
ANN ARBOR MI 48106-0904





INTRODUCING THE FASTEST STORAGE SOFTWARE ON EARTH

BrightStor™ Enterprise Backup

What good is storage software if it isn't fast enough to back up all of your critical information? BrightStor Enterprise Backup sets a new standard for high-speed storage software, which means you don't have to pick and choose what data to protect. So if you're looking for the best storage solution for UNIX, Windows NT, and Windows 2000, you just found it.

ca

Computer Associates™

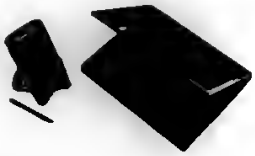
HELLO TOMORROW | WE ARE COMPUTER ASSOCIATES | THE SOFTWARE THAT MANAGES eBUSINESS™ ca.com/brightstor

©2001 Computer Associates International, Inc. (CA) All trademarks, trade names, service marks, and logos referenced herein belong to their respective companies

WAITING FOR A MEETING TO TALK ABOUT A MEETING

PERFECT TIME TO CHECK YOUR SHIPMENTS.





CHAIN YOURSELF TO THE NETWORK. NOT YOUR DESK. PRESENTING WIRELESS MOBILITY FROM COMPAQ.

Compaq complete mobility solutions allow your employees to do their work. Even when they're not at their desk. The new Compaq *Evo*™ Notebook N600c comes with a Mobile Intel® Pentium® III processor and an innovative MultiPort for wireless networking capability.* This means your team can access real information in real time. So now they can check current inventory, track sales or send e-mail from the conference room or the cafeteria. And if they want something even smaller, give them the iPAQ Pocket PC for PC functionality that fits in the palm of their hands.

Compaq Evo™ notebooks start at $999**

INNOVATIVE PRODUCTS,
INTEGRATED INTO SOLUTIONS &
DELIVERED GLOBALLY

find the wireless solution you need at compaq.com/mobile or call 1-800-888-6046

Compaq PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

*Wireless LAN provided either through MultiPort or PC card. Wireless WAN provided through PC WAN card. wireless air time contract required. 802.11 functionality (in a MultiPort module) is sold separately. PC cards sold separately. Subject to wireless network coverage. **Suggested retail price. Compaq, the Compaq logo, Evo, iPAQ and Inspiration Technology are trademarks of Compaq Information Technologies, L.P. in the U.S. and other countries. Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Products and company names mentioned herein may be trademarks or registered trademarks of other companies. ©2001 Compaq Computer Corporation.

COMPAQ
Inspiration Technology



THE ASSOCIATED PRESS

WHERE MUSLIM WORKERS FIND HAVEN FOR RESPECT

Some Muslim Americans, like the people shown here arriving for Friday services at a Paterson, N.J., mosque last month, have needed protection from attack. But many Muslim IT workers say they are doing well in the workplace, where co-workers have rallied around them with shows of support and respect. **PAGE 34**



BARRY ANTHONY

SYMBIOTIC INTELLIGENCE

The Internet's unique ability to foster human interaction may prove to be a hidden catalyst for solving some of society's toughest problems, say experts like Norman Johnson (at left) of Los Alamos National Laboratory. **PAGE 54**

OCTOBER 22 2001

COMPUTERWORLD THIS WEEK

NEWS 6

6 Microsoft puts part of the blame for its security woes on those who publicize the vulnerabilities.

7 Budget-conscious IT shops take a closer look at new development methods, such as extreme programming.

8 The U.S. Customs Service says American businesses need to beef up their IT security and logistics systems in order to secure the nation's borders.

9 Congress woos corporate backing for planned privacy legislation by offering federal preemption of any state privacy laws.

10 Users turn to Web services as a way to democratize enterprise application integration.

QuickLink For breaking news, updated twice daily at noon and 5 p.m., visit the *Computerworld.com* Web site:
www.computerworld.com/q?q4000

BUSINESS 25

25 Joe Auer tells of how a vendor used a "corporate jet" ploy to rush a customer into prematurely signing what amounted to a contract. But the scheme didn't fly.

32 Managing IT security in state-run nations such as China can be particularly vexing, but there are steps you can take to guard your networks.

38 Book Reviews: Leverage your competitors' strengths, think like your customers, and learn to unleash your employees' creativity.

40 Aggregation services launched by most banks during the past year have been bosted by third parties such as Yodlee, CashEdge and S1. But that's beginning to change.

45 Workstyles: Mapping the buman genome at Celera Genomics might be the ultimate challenge for IT professionals to support.

TECHNOLOGY 49

49 Getting IIS free with Windows obviously doesn't mean it won't cost you in the long run, says columnist Nicholas Petreley.

50 With Windows XP, Microsoft may finally be getting serious about security — but is it enough?

52 Support for Session Initiation Protocol has been included in Windows XP, the biggest step yet toward acceptance of the real-time communications standard.

56 QuickStudy: Knowledge management is the art of collecting organizational data and turning it into usable, accessible information.

58 Security Journal: Mathias Thurman conducts an internal security review and finds reasons for concern.

60 Emerging Companies: Infoteria's e-business tools ease supply chain transactions, but they rely on acceptance of RosettaNet.

OPINIONS 22

22 **Maryfran Johnson** says data storage is a big issue that IT managers should immerse themselves in today. Just don't bring it up with the CEO.

22 **Pimm Fox** writes tbat IT can get a big boost if Washington accelerates the depreciation schedule for computer equipment.

23 **Michael Gartenberg** outlines a few reasons why ubiquitous computing will supplant the PC from its dominant position.

70 **Frank Hayes** says Sun's program of making and delivering "ready to use" systems can help time- and resource-starved IT shops. But is that too revolutionary for users who like to install things themselves?

Editorial/Letters	22, 23
How to Contact CW	68
Company Index	68
Shark Tank	70

WWW.COMPUTERWORLD.COM

ONLINE

XP NEWS

Read the latest *Computerworld* coverage of Windows XP and hear what others have to say.
www.computerworld.com/q?a1140

ADOPT EARLY AND GET AN EDGE

Frost & Sullivan analyst Wai Sing Lee explains how businesses can get an edge over rivals by being among the first to use new wireless technologies.
www.computerworld.com/wireless

BE SURE THE VENDOR KNOWS ITS STUFF

Privacy consultant A.G. Breitenstein says companies must be sure vendors know what they're doing before buying applications to bring IT operations into compliance with the Health Insurance Portability and Accountability Act's data privacy regulations.
www.computerworld.com/security

EARNINGS ROUNDUP

For the latest coverage of IT industry quarterly results, visit our earnings news page.
www.computerworld.com/q?a1150

AT DEADLINE

IBM Upgrades z/OS For Mainframes

IBM introduced an upgrade of its z/OS mainframe operating system with new resource-sharing and security features. The z/OS V1 R2.0 release includes an intrusion-detection tool that scans incoming data for security threats, IBM said. the upgrade also lets users running Linux and z/VM applications use tools that can reallocate system resources.

Sun Delays Server Reconfiguration Tool

Sun Microsystems Inc. is delaying the release of a key software feature for its Sun Fire midrange Unix servers. The dynamic reconfiguration tool was described as a standard feature when the servers were announced earlier this year. Sun said it expects the tool to be available in next year's first quarter.

Charities Warn of Fake Donation Virus

Several relief agencies warned of a computer virus, dubbed Septer. Trojan, that disguises itself as an e-mail message requesting donations. The message contains an executable file that uploads data entered on a fake donation request form to a Web site that's not affiliated with the agencies, which include The American National Red Cross, United Way of America and The September 11th Fund.

Short Takes

Atlanta-based BELLSOUTH CORP. said it plans to lay off 3,000 employees after posting a third-quarter profit of $7 million, down from $1 billion in the same period last year. . . . A Belgian court rejected a financial restructuring plan filed by LERNOUT & HAUSPIE SPEECH PRODUCTS NV and lifted the leper, Belgium-based software vendor's bankruptcy protection in that country.

Microsoft: Loose Lips Give Hackers Tips

Vendor aims to curb vulnerability notices; users say: Just make better software

BY JAIKUMAR VIJAYAN

MICROSOFT announced last week a new system for rating the severity of security holes in its software. But it also urged the security community to exercise better judgmeot about publicizing software vulnerabilities and detailing how they can be exploited.

The practice of publishing explicit, step-by-step instructions for exploiting vulnerabilities contributed to the damage that was inflicted on users of Windows-based systems by recent worms such as Code Red and Nimda, said Scott Culp, manager of Microsoft's Security Response Center.

But several users said that while Microsoft had raised a valid and long-standing issue, the company itself is to blame for many of the security problems affecting its software.

"The problems are most certainly not caused by full disclosure. They're caused by bad coding practices," said Josh Turiel, network services manager at Holyoke Mutual Insurance Co. in Salem, Mass.

'Information Anarchy'

Io a note published oo Microsoft Corp.'s Web site last week, Culp lashed out at the "information anarcby" that "allows even relative novices to build bighly destructive 'malware' " using published information about vulnerability exploits.

People who make such information available have argued that it can belp systems administrators figure out bow to protect their systems. But Culp said in an interview that Microsoft's investigations of worms such as Nimda, Code Red and Sadmind clearly showed that those worms used exploit techniques similar to ones that had been detailed publicly — in some cases, they employed even the same file names and exploit code.

As a result, it's better to tell users only what systems are affected, how they're affected and what can be done to plug the holes, Culp said. For example, Microsoft said its new severity rating system is meant to give users a better idea of the risks posed by different vulnerabilities (see box).

Leaving specific examples of exploit code out of vulnerability information is generally a good idea, Turiel agreed. But, be added, "the danger, as I see it, is that if someone discovers a flaw and it's not repaired or disclosed to the public, bow do we defend against people who know about it?"

David Lelievre, a project manager at Tweddle Information Services Inc., an application service provider in Clinton Township, Mich., said the notion that "a systems administrator should bury his head in the sand and install patches without knowing what they are going to actually do to the system is ridiculous." A mere lack of published information is "not going to prevent the next wonder kid from writing a virus," he added.

With that in mind, Microsoft should focus on fixing the vulnerabilities in its software, not on criticizing those who publicize exploit information, said David Krauthamer, MIS manager at Advanced Fibre Communications Inc., a maker of telecommunications equipment in Petaluma, Calif.

However, Daniel McCall, an analyst at Waltham, Mass.-based security consultancy Guardent Inc., said Microsoft does bave a point.

"Our view is, don't tell people bow to break a system," McCall said. A far better approach would be to release vulnerability information only after a fix has been developed, he said. Guardent's policy is to inform vendors and other relevant parties when holes are discovered and then wait until patches are available before publicizing the flaws. ●

Quick Link Read what others are saying about Microsoft and security in our user forums.
www.computerworld.com/q?a1170

Danger Signs

Microsoft said it will use the following guidelines to rate the potential threat of security holes found in its software:

● CRITICAL ● MODERATE ● LOW

Internet Server
- Allows Web site defacement, denial of service or full control of systems.
- Difficult to exploit, requires an unusual configuration or has a temporary effect.
- Likely to have a limited impact, such as disclosure of scripts.

Internal Server
- Enables the elevation of user privileges and data thefts or modifications that are hard to audit.
- Allows auditable data disclosures, modifications or denial of service.
- Supports limited denial of service and untargeted or fragmentary thefts of data.

Client System
- Runs arbitrary code without user action; supports remote escalation of privileges.
- Exploits user actions; allows local escalation of privileges.
- Targets limited or fragmentary data thefts and modifications plus Web site attacks.

New Rating System Gets Fast Workout

Microsoft got a chance to use its new vulnerability severity rating system almost as soon as it was put in place. But the process was temporarily marred by a faulty patch.

Last week, Microsoft warned users of a moderate risk vulnerability affecting terminal servers using Windows NT 4.0 or Windows 2000 on corporate intranets. For deployments on external Web servers, the risk is low, the company said.

The denial-of-service vulnerability affects the Remote Data Protocol implementation that's included with the terminal service in the two operating systems, according to a security bulletin on Microsoft's Web site.

Rebooting a server that has failed because of the vulnerability will restore the system, but any work in progress at the time of the attack would be lost, Microsoft said. It recommended that users install a patch meant to plug the hole.

But more than 30 users reported that the patch itself caused system problems, according to the NTBugTraq mailing list. Microsoft pulled the patch from its Web site and said a new version would be released "shortly."

– Jaikumar Vijayan

Developers Approach Extreme Programming With Caution

Users say corporations are adopting only select aspects of the methodology

BY LEE COPELAND
TAMPA FLA

As corporations struggle to complete application development projects on time, within budget and without lots of buggy code, they're taking a closer look at new development methods, such as extreme programming.

While interest is growing within the ranks, attendees at the Object-Oriented Programming, Systems, Languages and Applications 2001 conference here said most companies are taking a piecemeal approach to using developer-driven techniques, such as extreme programming and agile modeling, instead of implementing them entirely.

Programmer Kent Beck developed the extreme programming methodology five years ago while serving as the project leader on Chrysler Comprehensive Compensation, a long-term project to rewrite Chrysler Corp.'s payroll application.

Today, Stuttgart, Germany-based DaimlerChrysler AG still uses extreme programming within several application development groups in the U.S. and Germany, said Christian Wege, portal and Web application architect at the automaker.

A la Carte Approach

But Wege said DaimlerChrysler emphasized just a few extreme programming approaches, such as unit testing and conducting frequent code reviews. Other tenets, such as pair programming, usually aren't implemented because most development teams are dispersed and application development is often outsourced, according to Wege.

Still, corporations are increasingly turning to new techniques to make the most of smaller development teams and to contend with more complex, distributed applications, said Chris Dial, an analyst at Cambridge, Mass.-based Forrester Research Inc.

"For new types of applications like Web services, the demand for well-structured code increases, and it's not possible to cut corners on design," said Dial.

New York-based entertainment channel Noggin LLC adhered to extreme programming techniques when it recently launched an interactive Web site that ties into the taping of its shows. The project was managed by CodeFab Inc., a New York-based development shop.

"We kept breaking [the project] down into many smaller projects," said Kenny Miller, vice president of programming and production at Noggin. "My fear was that the project would collapse under its own weight. [Extreme programming] allowed us to make incremental progress."

IT managers and developers are less certain of the degree to which they will follow each tenet of the new development methodologies.

Motorola Inc., for example, has used parts of extreme programming in some of its development organization but found that it wasn't useful for global development projects, said Ron Crocker, senior technical architect at the Schaumburg, Ill.-based company. "[Extreme programming] values small teams, and that's not always possible," he said.

But some developers say full-throttle extreme programming will drive higher quality and more rapid application development.

"The problem with [extreme programming] is the name," said James Knox, an independent development consultant in Ottawa. "After a lot of managers hear the name, it's downhill from there, and they get turned off," citing the word *extreme* as radical.

Knox said "there was zero management support" for extreme programming at his previous employer, so he struck out on his own to develop projects using the methodology.

Getting Extreme

IT departments are taking a closer look at new development methods, such as extreme programming and agile modeling.

Extreme programming advocates 12 core development practices, including:

- Application development teams put small code releases into production early
- Pair programming: Two developers work side-by-side
- On-site customer required to aid in project development
- All programmers given collective ownership of code and the ability to change it

Agile modeling includes general concepts, such as:

- Creating simple content
- Testing code often
- Using several design models

Quick Link Read about Capital One's experiences with extreme programming
www.computerworld.com/q?24331

Voice-Recognition Abilities Added to New CRM System

Aspect's self-service software supports use of 'voiceprints'

BY MARC L. SONGINI

Customer relationship management (CRM) software vendor Aspect Communications Corp. last week added voice-recognition technology to a self-service application that lets customers process transactions by telephone.

San Jose-based Aspect said the self-service software can now identify customers by their "voiceprints," eliminating the need for them to enter personal identification numbers (PIN) or other passwords to access account information or pay bills. The voice-recognition technology, developed by Nuance Communications Inc. in Menlo Park, Calif., is included in Version 6.0 of Aspect's Customer Self-Service tool.

Sheila McGee-Smith, a CRM analyst in Pittstown, N.J., said the voice-recognition feature wouldn't have been that noteworthy prior to the Sept. 11 terrorist attacks on the U.S. But now, banks and other security-conscious companies may "take a closer look at this than they might have" if the attacks hadn't occurred, she said.

Not Available Elsewhere

Large CRM players such as Siebel Systems Inc. don't offer homegrown voice-recognition capabilities with their software at this point, McGee-Smith said. A services person at San Mateo, Calif.-based Siebel confirmed that its voice-activated self-service application can't authenticate users by their voice patterns.

McGee-Smith noted that Dallas-based InterVoice-Brite Inc. does support voice recognition as part of the interactive voice response technology it sells. However, Aspect claimed that it also provides call center, e-mail and other CRM-related functions with its software.

Daniel Reagan, vice president of technology at Minneapolis-based Navitaire Inc., said the new voice-recognition tool could make self-service applications easier to use. "I think [customers] would welcome a system where you use your own voice," he said. "Certainly, things that can't be stolen are beneficial."

Navitaire, an application service provider that has contracts with about 40 airlines, uses Aspect's applications to let corporate users do things such as book flights. Currently, Navitaire relies on PINs and other traditional authentication procedures to verify the identities of customers, Reagan said.

He added that he hasn't investigated what it would cost to install Aspect's new software or whether Navitaire's IT infrastructure would have to be upgraded to support the voice-recognition technology.

AT A GLANCE

Numbers Game

In addition to announcing its self-service product last week, Aspect issued updates about its financial status:

- Reported a **$25.7 million third-quarter loss** on revenue of $108.7 million, down from year-earlier sales of $148.5 million.
- Said it expects **fourth-quarter revenue** to be flat with the third-quarter level, at best.
- Announced it was **laying off about 350** employees, reducing the company's workforce by 16%.

U.S. Customs Needs Delivery Firms to Improve IT Security

Better logistics systems necessary to protect borders following Sept. 11 attacks

BY LINDA ROSENCRANCE

THE U.S. CUSTOMS Service has beefed up its technology in the wake of the Sept. 11 terrorist attacks on the U.S. But without similar investments in IT security and logistics systems by American businesses, securing the nation's borders will remain an elusive goal.

"Efforts to improve security at the border entry points require that parallel security efforts be undertaken in the ... transportation and logistics network," said Stephen Flynn, a senior fellow with the National Security Studies Program at the Council on Foreign Relations Inc. in New York.

During an average year, the Customs Service processes 10.8 million trucks, 5.3 million vessel cargo containers, 1.9 million rail cars and 786,000 commercial aircraft, according to data from the agency. Before Sept. 11, the Customs Service inspected 3% of the commercial shipments coming into the U.S.

Time Is Precious

Tighter security and increased inspections have resulted in hours-long delays for commercial traffic from Mexico and Canada. And while the country remains on a Level 1 Alert, businesses are worried about losing money because goods are often delayed as imports are being more heavily scrutinized, said Adrian Gonzalez, an analyst at ARC Advisory Group Inc. in Dedham, Mass.

Manufacturers with lean supply chains using just-in-time delivery strategies are most affected, he said. Even with the Customs Service's increased use of nonintrusive inspection (NII) technology, including mobile and fixed-site X-rays, vehicle gamma-ray imaging systems, portable contraband detectors and vapor particle detectors, critical inventories are held up during lengthy border inspections.

John Pennella, executive director of applied technology at the Customs Service, said the agency has purchased 103 NII systems capable of scanning containers and has deployed 68 of these large-scale systems. In addition, more than 200 smaller X-ray systems have been deployed at various air, land and seaport entries. Pennella said his agency is working with shippers to identify technology that could be used to ensure their shipments aren't being used to transport contraband.

Flynn said shippers and carriers could adapt tracking technology — such as electronic tagging and universal bar codes — to provide border control agents with timely, detailed information on their cargo. This in-transit accountability would let authorities act on intelligence of a potential breach in security before shipments arrive at the borders. Nonsuspicious cargo could be cleared for entry without delay at the borders, he said.

One such cargo security system, SmartSeal, developed by Savi Technology Inc. in Sunnyvale, Calif., is being eyed by the National Association of Manufacturers (NAM) in Washington and its counterpart in Canada as a way to keep trade flowing while ensuring border security, according to a NAM spokesman.

SmartSeal is already being used by the U.S. Department of Defense, as well as the logistics arm of Hong Kong-based Hutchison Port Holdings, which said the product saves the company about four hours at border crossings between Hong Kong and China. The SmartSeal, which is attached to a container, produces an alert if anyone tampers with the container. ▶

How SmartSeal Works

1. Real-time data is collected through a specially designed radio frequency ID tag that is used to seal and secure a container after it has been packed and inspected.
2. With SmartSeal, all types of cargo containers can be packed, inspected and sealed at the time of loading and continuously monitored during transport.
3. Once secured, the SmartSeal tag electronically detects and reports any tampering, enabling continuous monitoring of the shipment.
4. The container can then be isolated and inspected or prevented from being loaded or moved.

Feds Ask Business Leaders to Help Protect Infrastructure

30 top executives to serve on national advisory council

BY DAN VERTON

WASHINGTON

Even as the fear of biological warfare paralyzed portions of the nation's capital last week, a picture of renewed cooperation between the government and industry on critical infrastructure protection was beginning to emerge.

The Bush administration last week finalized the executive order establishing the President's Critical Infrastructure Protection (CIP) Board under Richard Clarke, the nation's newly appointed cybersecurity czar.

The administration had approved the order in draft form at least four months ago.

The finalized order clears up many of the questions that had emerged about the future of various federal agencies that have a stake in critical infrastructure protection efforts, including cybersecurity. For example, many observers had been uncertain about the future roles of the FBI's National Infrastructure Protection Center (NIPC) and the U.S. Department of Commerce's Critical Infrastructure Assurance Office (CIAO), but the executive order names the directors of both agencies as members of the board's coordinating committee, effectively ensuring the agencies' survival.

The NIPC, based at FBI headquarters, was formed in 1998 to handle threat assessment, investigations and responses to any attacks on critical U.S. infrastructures.

Also established in 1998, the CIAO is responsible mainly for integrating various private-sector security plans into a single national plan, known as the National Plan for Information Systems Protection.

"We're a member of the board," said John Tritak, director of the CIAO, when asked if the executive order had cleared up any doubts he may have had about his agency's future. "It ensures a dedicated line of funding," he added.

The order also formally established the National Infrastructure Advisory Council (NIAC), a 30-member panel of private-sector experts that will advise the president on the security of information systems that support various sectors of the economy, such as banking and finance, transportation, manufacturing and energy. Industry CEOs will comprise the bulk of the NIAC, which is charged with enhancing security cooperation between private companies and the government.

Ronald Dick, director of the NIPC, said the Bush administration's executive order establishing the CIP Board raises the bar on accountability in the federal sector through explicit language that holds the heads of federal agencies responsible for the security of their IT systems and networks.

"That's an important step," said Dick. "The government is hopefully going to be an example to the private sector." ▶

The Role of the New CIP Board

- **Initiate** cooperation with private firms, state and local governments.
- **Enhance** information sharing.
- **Conduct** incident coordination and crisis response along with the NIPC and other agencies.
- **Recruit, train and retain** government IT security experts.
- **Promote** IT security research and development.
- **Coordinate** information sharing between law enforcement and national security agencies.

Quick Link A Senate bill would create incentives for sharing of cybervulnerability information
www.computerworld.com/q?24329

U.S. Customs Needs Delivery Firms to Improve IT Security

Better logistics systems necessary to protect borders following Sept. 11 attacks

BY LINDA ROSENCRANCE

THE U.S. CUSTOMS Service has beefed up its technology in the wake of the Sept. 11 terrorist attacks on the U.S. But without similar investments in IT security and logistics systems by American businesses, securing the nation's borders will remain an elusive goal.

"Efforts to improve security at the border entry points require that parallel security efforts be undertaken in the ... transportation and logistics network," said Stephen Flynn, a senior fellow with the National Security Studies Program at the Council on Foreign Relations Inc. in New York.

During an average year, the Customs Service processes 10.8 million trucks, 5.3 million vessel cargo containers, 1.9 million rail cars and 786,000 commercial aircraft, according to data from the agency. Before Sept. 11, the Customs Service inspected 3% of the commercial shipments coming into the U.S.

Time Is Precious

Tighter security and increased inspections have resulted in hours-long delays for commercial traffic from Mexico and Canada. And while the country remains on a Level 1 Alert, businesses are worried about losing money because goods are often delayed as imports are being more heavily scrutinized, said Adrian Gonzalez, an analyst at ARC Advisory Group Inc. in Dedham, Mass.

Manufacturers with lean supply chains using just-in-time delivery strategies are most affected, he said. Even with the Customs Service's increased use of nonintrusive inspection (NII) technology, including mobile and fixed-site X-rays, vehicle gamma-ray imaging systems, portable contraband detectors and vapor/particle detectors, critical inventories are held up during lengthy border inspections.

John Pennella, executive director of applied technology at the Customs Service, said the agency has purchased 103 NII systems capable of scanning containers and has deployed 68 of these large-scale systems. In addition, more than 200 smaller X-ray systems have been deployed at various air, land and seaport entries. Pennella said his agency is working with shippers to identify technology that could be used to ensure their shipments aren't being used to transport contraband.

Flynn said shippers and carriers could adapt tracking technology — such as electronic tagging and universal bar codes — to provide border control agents with timely, detailed information on their cargo. This in-transit accountability would let authorities act on intelligence of a potential breach in security before shipments arrive at the borders. Nonsuspicious cargo could be cleared for entry without delay at the borders, he said.

One such cargo security system, SmartSeal, developed by Savi Technology Inc. in Sunnyvale, Calif., is being eyed by the National Association of Manufacturers (NAM) in Washington and its counterpart in Canada as a way to keep trade flowing while ensuring border security, according to a NAM spokesman.

SmartSeal is already being used by the U.S. Department of Defense, as well as the logistics arm of Hong Kong-based Hutchison Port Holdings, which said the product saves the company about four hours at border crossings between Hong Kong and China. The SmartSeal, which is attached to a container, produces an alert if anyone tampers with the container. ▶

How SmartSeal Works

1. Real-time data is collected through a specially designed radio frequency ID tag that is used to seal and secure a container after it has been packed and inspected.
2. With SmartSeal, all types of cargo containers can be packed, inspected and sealed at the time of loading and continuously monitored during transport.
3. Once secured, the SmartSeal tag electronically detects and reports any tampering, enabling continuous monitoring of the shipment.
4. The container can then be isolated and inspected or prevented from being loaded or moved.

Feds Ask Business Leaders to Help Protect Infrastructure

30 top executives to serve on national advisory council

BY DAN VERTON
WASHINGTON

Even as the fear of biological warfare paralyzed portions of the nation's capital last week, a picture of renewed cooperation between the government and industry on critical infrastructure protection was beginning to emerge.

The Bush administration last week finalized the executive order establishing the President's Critical Infrastructure Protection (CIP) Board under Richard Clarke, the nation's newly appointed cybersecurity czar.

The administration had approved the order in draft form at least four months ago.

The finalized order clears up many of the questions that had emerged about the future of various federal agencies that have a stake in critical infrastructure protection efforts, including cybersecurity. For example, many observers had been uncertain about the future roles of the FBI's National Infrastructure Protection Center (NIPC) and the U.S. Department of Commerce's Critical Infrastructure Assurance Office (CIAO), but the executive order names the directors of both agencies as members of the board's coordinating committee, effectively ensuring the agencies' survival.

The NIPC, based at FBI headquarters, was formed in 1998 to handle threat assessment, investigations and responses to any attacks on critical U.S. infrastructures.

Also established in 1998, the CIAO is responsible mainly for integrating various private-sector security plans into a single national plan, known as the National Plan for Information Systems Protection.

"We're a member of the board," said John Tritak, director of the CIAO, when asked if the executive order had cleared up any doubts he may have had about his agency's future. "It ensures a dedicated line of funding," he added.

The order also formally established the National Infrastructure Advisory Council (NIAC), a 30-member panel of private-sector experts that will advise the president on the security of information systems that support various sectors of the economy, such as banking and finance, transportation, manufacturing and energy. Industry CEOs will comprise the bulk of the NIAC, which is charged with enhancing security cooperation between private companies and the government.

Ronald Dick, director of the NIPC, said the Bush administration's executive order establishing the CIP Board raises the bar on accountability in the federal sector through explicit language that holds the heads of federal agencies responsible for the security of their IT systems and networks.

"That's an important step," said Dick. "The government is hopefully going to be an example to the private sector." ▶

Quick Link A Senate bill would create incentives for sharing of cybervulnerability information.
www.computerworld.com/q?24329

Proposed Federal Privacy Law Would Override States

Bill aims to prevent patchwork rules on data collection, use

BY PATRICK THIBODEAU
WASHINGTON

A comprehensive data privacy bill to be introduced next year in the U.S. House will apply to online and off-line practices, affecting virtually every company that does business in the U.S.

The legislation, which has the backing of some key congressional leaders, will set baseline standards on privacy, requiring clear and conspicuous data privacy notices. It will also give customers the ability to prevent a company from selling their personal information and require a "security statement" explaining what precautions a company has taken to protect private information.

But the bill, proposed by leaders of the House Energy and Commerce Committee, will be tied to a big carrot in an effort to win corporate backing, namely federal preemption of any state privacy laws. The intent is to prevent a patchwork of privacy legislation, varying from state to state.

If large commercial states such as California were to adopt their own privacy laws, companies such as Columbus, Ohio-based Nationwide Financial Services Inc. could be forced to spend millions of dollars to bring systems into compliance with those laws, said Kirk Herath, chief privacy officer at Nationwide.

Protective Measure

But so far, the prospect of varying state laws has remained only a threat. States have recognized that problem, said Herath, a frequent speaker on privacy issues.

"I believe the vast majority of states have heard us and have done the right thing by remaining uniform," he said. The insurance industry, mostly through its trade groups, has been opposing adoption of state privacy laws.

The proposal, which was introduced by Commerce Committee Chairman Billy Tauzin (R-La.), and some other key House leaders, is getting mixed reviews.

Privacy advocates said the proposal fell short of what they want; industry groups were wary about potential fine print.

For instance, the framework's provisions call for easy-to-read and conspicuous privacy policy notices. That led to questions about how such a requirement would affect Web site design.

"How do you make that clear and conspicuous?" asked Mark Uncapher, vice president and counsel at the Information Technology Association of America in Arlington, Va., which has opposed privacy regulation. "The challenge is to get the right level of specificity."

Ari Schwartz, a policy analyst at The Center for Democracy & Technology (CDT) in Washington, said the proposal is "too weak to protect individuals in the networked economy" and would do little to bring people who are worried about privacy protections back online. The proposal relies on an opt-out model, which requires a user to affirmatively reject information sharing.

There's a good reason for businesses to support privacy rules: consumer privacy concerns are hurting online commerce, said John McCarthy, an analyst at Forrester Research Inc. in Cambridge, Mass. Consumer concerns about privacy cost online businesses at least $15 billion annually, he said. Forrester estimates that total online spending this year will be $51 billion.

"Privacy is now the No. 1 reason why people do not shop online," said McCarthy. The Commerce Committee proposal "would at least put some clear rules in place," he said.

Potential New Privacy Rules

Members of a key House committee are preparing to introduce a major privacy bill next year affecting off-line and online privacy practices. Key provisions include:

Federal preemption: The legislation will prevent states from adopting tougher privacy rules on their own.

Liability limits: Restrictions will be set on class action lawsuits filed against privacy violators.

Opt-out: If online, a user may have to uncheck a box to be excluded from data sharing.

Privacy notices: Web sites will be required to have clear and conspicuous privacy notices.

Safe harbor provision: A company would be considered in compliance with the federal baseline rules if it belonged to a private certification program.

Enforcement agency: Federal Trade Commission

Tax Moratorium Expires as Anthrax Distracts Senate

States could burden Net sales with levies

BY PATRICK THIBODEAU
WASHINGTON

Concerns about bioterrorism at the U.S. Capitol preempted consideration of a time-sensitive Internet-related measure, the extension of the online tax moratorium, which expired yesterday.

The U.S. House of Representatives last week approved a two-year extension, far shorter than the five-year extension proponents originally wanted but easier to pass because of the controversy surrounding the bill. But the Senate failed to act by the end of last week, thus allowing the ban to expire. That means state and local governments could begin imposing access taxes, if they choose to.

Senate debate was cut short by the Capitol anthrax sweep, and the issue could resurface in the Senate this week.

The moratorium affected only Internet access taxes, which critics have assailed as akin to charging someone admission to enter a shopping mall. But the issue has been tied to the broader question of whether online sellers should collect sales taxes from all of their customers.

Simplicity Sought

Under current law, a business is required to collect sales taxes only in states where it has a physical presence. But nearly 40 states are involved in an effort to simplify sales taxes, create one rate per state and reduce the burdens on business for collection of sales taxes. Backers of this effort want Congress — in any extension of the access tax moratorium — to also signal support for expanded sales tax collection obligations if tax simplification can be achieved.

It's uncertain what will happen now that the moratorium has ended.

"Nothing — nothing — is going to happen on Monday," said Frank Shafroth, director of state/federal relations at the National Governors Association, who sees no clamor among the states for taxing Internet access.

But Mark Nebergall, chairman of The Internet Tax Fairness Coalition, which is backing the moratorium extension, said a failure by Congress to act would be a signal to the states "that it's OK for them to impose special taxes on electronic commerce." The action wouldn't come from state legislatures, but from state revenue authorities interpreting current laws, he said.

A study released this month by the Center for Business and Economic Research at the University of Tennessee in Knoxville estimates that e-commerce this year is likely to cost state and local governments $13.3 billion in lost tax collections. By 2006, that loss will reach $45.2 billion.

Changes Eyed in Cyberdefenses

A special congressional commission, headed by Virginia Gov. James Gilmore, that's investigating weapons of mass destruction outlined recommendations last week for improving cyberdefenses. But a presentation by Gilmore before the U.S. House Science Committee was cut short because of bioterrorism concerns at the Capitol. The following were his recommendations:

- Establish a third-party mediator by creating a nonprofit group that could resolve disputes over the sharing of security information between the private sector and government.
- Create a "cybercourt" to be overseen by judges with expertise in cyberdefense issues.
- Improve planning on the way the government handles IT research.

– Patrick Thibodeau

Quick Link For more information, visit our Washington special focus page online
www.computerworld.com/q?s1200

BRIEFS

Microsoft Sales Up, But Profits Down

Citing strong sales of Windows 2000 and its enterprise server software, Microsoft Corp. reported $8.1 billion in revenue for its first quarter ended Sept. 30, up 6% from $5.8 billion in the same period last year. First-quarter net income was $1.3 billion, down from the year-earlier level of $2.2 billion due to more than $1 billion in investment losses.

New Mediator Picked In Antitrust Case

Eric D. Green, a Boston-based trial mediator, author and law professor, was chosen by the two sides in the Microsoft antitrust case to try to help them reach a settlement. U.S. District Court Judge Colleen Kollar-Kotelly has set a Nov. 2 deadline for producing a settlement, but legal analysts said they expect her to extend the deadline if Green reports that he's making progress.

Sun Loses $180M; Revenue Drops 43%

Sun Microsystems Inc. reported a $180 million net loss for its first quarter ended Sept. 30, as revenue plummeted 43% from the same period a year ago. Sun did $2.9 billion worth of business in the first quarter, down from year-earlier revenue of $5 billion. The company warned of the loss earlier this month and said it would lay off 3,900 employees, cutting its workforce by 9%.

Short Takes

CISCO SYSTEMS INC. recalled about 95,000 power adapters sold with six of its Asymmetric Digital Subscriber Line routers, saying they can overheat, causing a fire hazard. . . . Worldwide PC shipments declined by more than 10% year over year in the third quarter, according to both Framingham, Mass.-based IDC and GARTNER INC.'s DATAQUEST INC. unit in San Jose.

Web Services Get Off Drawing Boards

Users implement new technology as part of application integration projects

BY MICHAEL MEEHAN

UNTIL NOW, WEB services have been more theory than reality. But users are starting to turn to them as a way to democratize enterprise application integration (EAI).

An early adopter of this nascent application development approach is Wachovia Securities Inc., which is setting up a Web services pilot program with Thomson Financial, a $2 billion Boston-based information services company.

If the pilot program is successful, Wachovia plans to replicate the services with smaller partners.

"The concept for me is to externalize my internal data sets," said John D'Agostino, chief operating officer at Winston-Salem, N.C.-based financial services provider Wachovia. "In the past, I would have to set up direct links between myself and my partners or use some third-party vendor to do it."

Speeding Applications

D'Agostino's criticism of e-business to date is that the applications have been expensive and can force users to mimic the one-to-one links in the off-line world.

"My hope with Web services is that they'll actually reach that broader audience in a simple but useful fashion," D'Agostino said.

San Francisco-based Grand Central Networks Inc. will be the EAI vendor in this case, using Web services to get the job done. Applications will encounter one another on the network using the Simple Object Access Protocol (SOAP) and be identified using the emerging Web Services Description Language (WSDL).

In a separate initiative, Gaithersburg, Md.-based GE Global eXchange Services (GXS) and Houston-based FuelQuest Inc. announced the creation of a Web services-based EAI program that lets fuel distributors plug into a GXS-hosted trading network of U.S. refiners.

When regional distributors load up a truck at a refinery, they will receive an electronic bill of lading that downloads directly into their financial systems. The bill can then be passed along to the distributors' customers.

"In an industry where fax machines were a novelty a decade ago, this is a big deal," said Mary Wilson, vice president at J.E. DeWitt Inc., a South El Monte, Calif.-based petroleum distributor.

Wilson noted that manual data entry of paper bills of lading has long been a problem in the fuel distribution industry. But previous e-commerce solutions proved either too costly, too complex or too cutthroat, she said.

"Some vendors, you could tell by the way they were building their systems that their ultimate goal was to control the customer base and cut me out," Wilson said.

Off-Loading to Smaller Firms

GXS Chief Technology Officer Frank Campagnoni explained that the new system is just a way to off-load applications to smaller companies.

The standard program interfaces have been defined using WSDL. It's the first time GXS has used this Web service commercially, but Campagnoni called the EAI program "the first blush of a strategic initiative that's going to be implemented inside of GXS."

"Up until this point, we haven't really had the access mechanisms from the Internet into our systems," he added.

Other EAI vendors plan to follow in the Web services arena. Andrea Eubanks, director of products at Tibco Software Inc., said the Palo Alto, Calif.-based company plans in the first quarter of next year to release its own set of SOAP interfaces and WSDL adapters.

Karen Peterson, an analyst at Stamford, Conn.-based research firm Gartner Inc., said that applications will eventually be built using Web services. But the early payoff for users will be in the EAI space, she added.

GLOSSARY

New Tools

WSDL: Web Services Description Language is an XML-based language used to describe the services a business offers and to provide a way for individuals and other businesses to access those services electronically

SOAP: Simple Object Access Protocol allows operating systems to speak with one another over the Web using HTTP and XML

UDDI: Universal Description, Discovery and Integration is envisioned as a Web-based Yellow Pages where businesses can list pertinent information, including the services they offer

EAI Software Shifts to Business-Process Management Uses

Once limited to use by a few highly trained technicians, enterprise application integration (EAI) is maturing into a broadly useful tool for IT.

Sylvain Pendaries, director of IT for capital markets at the New York-based arm of French bank Societe Generale Group, has seen EAI grow up since his first encounter with Tibco Software's Rendezvous product in 1996.

"It took care of transport, but that was mainly a tool for technicians," Pendaries said.

Societe Generale now plans to migrate to Tibco's latest EAI management tool with an eye toward making it a working part of every employee's life.

"It's far more than a collection of systems linked with middleware; it's more of a business information network," he said.

According to Daryl Plummer, an analyst at Gartner Inc. in Stamford, Conn., EAI vendors are attempting to evolve their products into business-process management tools that let nontechnical workers adjust inputs and outputs in order to make changes in a system without having to touch any code.

"It's not there yet. But is that the plan? Is that the direction? Is that the next step? I'd have to say yes," Plummer said. "It's moving up the food chain, so to speak."

Cynthia Pacheco, operations manager for e-care services at Philips Medical Systems North America Inc. in Bothell, Wash., a division of Royal Philips Electronics NV, is looking to next-generation EAI products from Cysive Inc. in Reston, Va.

Philips Medical sells and leases in-home cardiac monitoring devices to chronic care facilities and in-home congestive heart failure patients.

Because many of the devices get recycled, Pacheco said, the initial use for the Cysive product would be to co-manage supply chain order tracking and patient care information.

However, future iterations of the application may be most important as the company adds medical personnel and hospital administrators to the network.

"These aren't technical people. Ease of use is a big issue for us," Pacheco said.

Andrea Eubanks, Tibco's director of products, acknowledged that the market is shifting.

"It's no longer about competitive advantage," she said. "The users now want more business use and less reliance on the network guys."

– *Michael Meehan*

You're right, Dell doesn't have one service person with all the answers.
There are thousands more where Carl came from.



Dell | Enterprise

I am Dell Enterprise. PowerEdge™ servers, PowerVault™ storage, infrastructure software, and Premier Enterprise Services. And I am backed by thousands of service and support people on-site, online and on the phone. Each able to point to the solution, instead of pointing fingers. Surprised? You shouldn't be. Because when Dell builds your custom Intel® processor-based server and storage solution, Dell also builds a total knowledge base. From configs to upgrades to service, Dell puts your entire history at your support team's fingertips, 24/7. All it takes is one walk down the hall, one e-mail or one phone call to start answering your questions. So you can increase uptime. Speed deployment. And cut costs.

That's why Dell is ranked #1 in customer satisfaction for Intel® processor-based servers*. To learn what customers and analysts are saying about Dell Enterprise, visit us at dell.com/enterprise3

XEON

Total accountability. On-site, online, on the phone. Easy as DELL

Call 1-877-430-DELL or visit www.dell.com/enterprise3

Dell, PowerEdge, PowerVault and the Dell logo are registered trademarks of the Dell Computer Corporation. ©2001 Dell Computer Corporation. All rights reserved.

Sprint Drops ION, Freezes Fixed Wireless Service

Users of costly integrated network need to switch to other technologies

BY JAMES COPE

SPRINT CORP. last week announced that it's pulling the plug on ION, its converged communications system, and putting a hold on sales of its broadband fixed wireless service until "substantial progress" is made in developing a new version of that technology.

Sprint said it will try to transition users of its Integrated On-Demand Network (ION) service to other technologies. The 400 corporate customers that now use ION will be redirected to the company's Asynchronous Transfer Mode (ATM) and virtual private network services, said a Sprint spokesman.

ION, which was introduced three years ago, is an ATM-based service that's designed to handle voice, data and video communications on a single network. But the company spokesman said it would have taken as many as three more years to make ION profitable.

Small Users

A few large companies, including Hallmark Cards Inc. in Kansas City, Mo., and Yellow Freight System Inc. in Overland Park, Kan., had signed up to use ION. But most of the service's corporate users were smaller businesses, according to Sprint.

Mason Rotelli, an ION user and CIO at cabling distributor Communications Supply Corp. in Carol Stream, Ill., said he was "very disappointed" when Sprint told him it was discontinuing the service. Communications Supply has been using ION for data network connections between its headquarters and 32 regional offices as well as for Internet access and voice telephone services.

"ATM and ION were the right technologies," said Rotelli. Sprint agreed to support his ION setup for another 18 months, completing the term of Communications Supply's contract, he added. After that, Rotelli said, he will look at the alternatives Sprint has to offer before shopping elsewhere.

Michael Speyer, an analyst at The Yankee Group in Boston, said the ION technology "was mostly there" from a development standpoint. But sales were lower than expected, making it a huge cash drain on the company, he said.

Another analyst, Rob Carlson at Current Analysis Inc. in Sterling, Va., estimated that Sprint has spent between $4 billion and $5 billion on ION. With a total of about 4,000 customers when consumers are included, that investment amounts to more than $1 million per user, Carlson said.

Sprint isn't completely exiting the fixed wireless business. The company will stop selling its Multichannel Multipoint Distribution Service (MMDS) offering to new customers and freeze the number of markets in which the service is available. But Sprint said it will continue to support existing MMDS users.

The problem with MMDS, the Sprint spokesman said, is that the current line-of-sight technology limits its coverage area to 50% or less of the market in most metropolitan areas.

Sprint is working on a second-generation MMDS service that it hopes will mitigate the coverage problems, but the company wouldn't say when that upgrade might be available to customers.

Chandra Welton, Internet sales manager at Larry Roesch Chrysler Jeep in Elmhurst, Ill., said the MMDS service the car dealer installed this summer is working fine.

"At this point, ... I'm not that concerned [about Sprint's decision]," Welton said. ▶

JUST THE FACTS

Service Interruptions

The cutbacks that Sprint announced last week include the following:

- Its ION integrated networking service will be shut down, forcing users to switch to other offerings.
- Marketing of its MMDS fixed wireless service will be stopped indefinitely, although existing users will still be supported.
- 6,000 Sprint workers will be laid off, and 1,500 contractors will be let go.
- The company will take a $2 billion charge to cover costs associated with the ION shutdown and job cuts.

Continued from page 1

E-Signatures

been a good bit slower than most people would have expected," said Thomas Crocker, a lawyer at Washington-based Alston & Bird LLP who earlier this year submitted comments on the issue to the Federal Trade Commission.

The so-called E-Sign legislation gives electronic signatures and contracts the same legal standing as their ink counterparts. But although it arrived with much fanfare and hype, the law has failed to trigger any widespread adoption of electronic signatures, said Steve Schutze, director of e-strategies at the Washington-based American Bankers Association. The organization represents nearly 98% of all banks operating in the U.S.

"Even though it's been a year, people are still asking about how to implement e-signatures and finding out how to manage their risk, as well as protect customer assets and their own interest," Schutze said.

That's because "the E-Sign act, in its present form, fails to deliver on its promises of uniformity, consistency and legal certainty," Crocker said.

For starters, the E-Sign law doesn't specify what constitutes an electronic signature, leaving it to the industry to develop the needed standards, according to Meredith Hickman, an analyst at Celeot Communications LLC in New York. Everything from passwords and personal identification numbers to dual-key encryption, digital certificates and biometrics can be used as electronic signatures. "Therefore, there is no obvious choice for companies to choose when building out their infrastructure," said Hickman.

Companies are particularly reluctant to use electronic signatures for big transactions, such as signing a mortgage contract, said Richard Lewis, chief technology officer at ClosingGuard.com Inc., a New York-based mortgage closing services company. That's because there isn't yet a reliable way to establish the identity of people online, Lewis said.

Unlike driver's licenses and other legal forms of identification, most of the forms of ID used online, such as digital certificates, are issued by a variety of vendors, not by a single governing entity, he said.

And since there's no case law based on the use of electronic signatures, there's no telling how an electronically signed document such as a mortgage contract would hold up if challenged in court 10 years down the road, Lewis said.

A lack of common standards among the infrastructure technologies in an e-signature network only compounds this problem, said Tom Greco, president of Digital Signature Trust Co., a digital certificate vendor in Salt Lake City.

It's also crucial for companies to understand the technology and business implications of the consumer protection provisions built into the E-Sign law, said Eric Goldberg, assistant counsel at the Washington-based American Insurance Association, which represents more than 370 large and small insurers nationwide.

Under the E-Sign law, companies that accept electronic signatures have to go through a series of steps to inform consumers about other options and get their consent. Companies also need to ensure that consumers reasonably demonstrate their ability to store and access digital documents before they are allowed to send and receive digital documents.

Such stipulations can result in a legal quagmire for companies, Goldberg said.

Dueling state and federal statutes are also a major problem, Crocker said.

In July 1999, the Chicago-based National Conference of Commissioners on Uniform State Laws adopted the Uniform Electronic Transactions Act (UETA), which like E-Sign, legalizes electronic documents and signatures. The consumer consent provisions of UETA aren't quite as stringent as those in E-Sign. But because of the way E-Sign has been drafted, some of the states that adopted UETA are sticking to its provisions. In other states, it's not clear which law businesses should follow.

As a result, companies, especially those with operations in multiple states, aren't sure how to proceed, Goldberg said. ▶

Quick Link Most companies will use e-signatures in B2B transactions rather than in consumer commerce.
www.computerworld.com/q/724285

THE STRAIGHT GOODS ON RESTRICTED PROMOTIONS.

Oracle has issued a bold offer. They'll give a million dollars to any DB2, WebLogic or SQL Server user who switches to Oracle technology and fails to triple the performance of their website. Pretty impressive talk.

Some say Oracle is putting their money where their mouth is. But for Sybase users, it's pure silence.

For that, we apologize. But we wonder. Why are Sybase users exempt from this extraordinary piece of generosity?

To begin with, our tests show that Sybase Enterprise Application Server (EAServer) is right there with Oracle, performing as fast and sometimes faster than some of our competition.

EAServer 4.0 has what it takes to manage millions of transactions a day and the scalability to reliably support thousands upon thousands of concurrent users.

Big deal, you say. That's the cost of entry for an app server. We think not.

The real cost of entry is what happens when your app server enters your environment.

Will your app server leverage your existing investments? Or will it strangle your IT department for a couple of months in a slow and very painful integration process?

In reality, that's where all the really substantial costs are hidden.

And it's here where EAServer really leaves the competition whimpering. EAServer is the most open application server available on the planet. It's J2EE certified. It supports C, C++, CORBA, COM and PowerBuilder, as well as virtually every switch, server and legacy system known to IT. It also allows for complete integration with any back-end database using JDBC or ODBC databases.

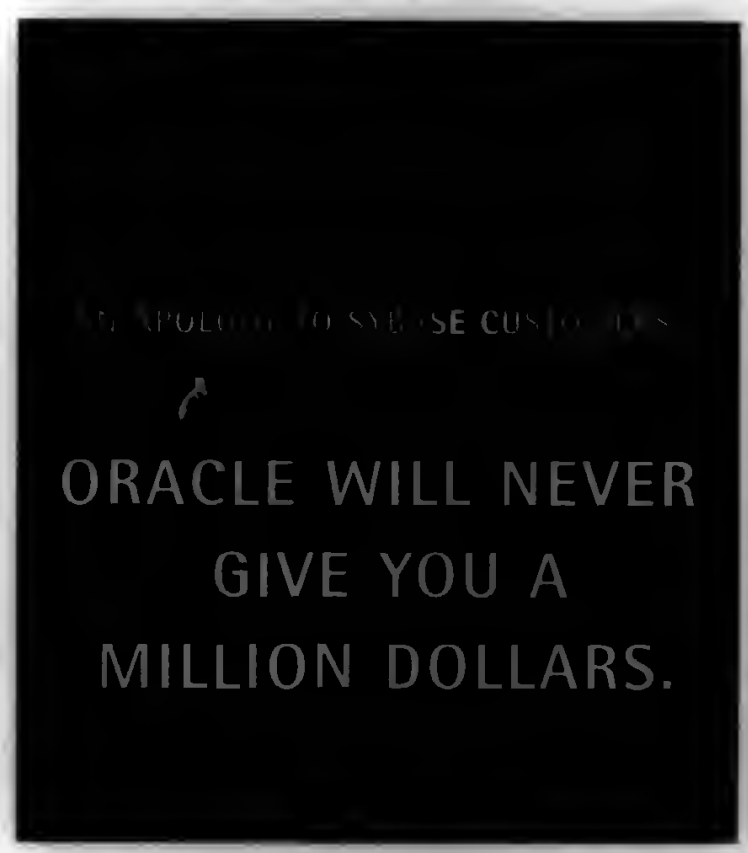
Just run those specs up against the competitors.

Naturally, it also has enterprise-class security. The kind of security you can bet a couple of million credit card numbers on.

And last but not least, EAServer provides you with a wicked fast and intuitive development environment that will amaze your friends and delight your superiors as you get your stuff out to the market really, really fast.

So there you have it. We think perhaps now you have a much better understanding of why all Sybase users were excluded from the very famous Oracle lottery.

Indeed, we're sorry our technology does make you ineligible for those Oracle millions. But look on the bright side: With EAServer, you can help your business earn some millions of its very own.





For more information on how you can get a great application server, if not a million bucks, visit www.sybase.com/customers or call 1-800-8-SYBASE.

SYBASE®
Information Anywhere™

©2001 Sybase, Inc. All rights reserved. All trademarks are the property of their respective owners.

SYBASE e-BUSINESS SOFTWARE.
BECAUSE EVERYTHING WORKS BETTER WHEN EVERYTHING WORKS TOGETHER.™

BRIEFS

CA Again Reports Conflicting Results

Computer Associates International Inc. again reported two sets of financial results with sharp differences. Under a new accounting and revenue formula it adopted last year, the Islandia, N.Y.-based software vendor earned a pro forma profit of $356 million on revenue of $1.4 billion for its second quarter ended Sept. 30. But using traditional accounting, CA lost $291 million on revenue of $734 million.

SAP Cuts Forecast, Hints at Layoffs

Business applications vendor SAP AG reported a 19% year-over-year revenue increase for the third quarter but lowered its sales forecast for the rest of this year because of delays in software-buying decisions by users. SAP also said it's accelerating cost-cutting actions, "including adjusting the levels and mix of its employees, particularly in the U.S."

Compaq Rolls Out Two New AlphaServers

Compaq Computer Corp. added new midrange and supercomputer models to its AlphaServer systems line. The midrange ES45 server runs Compaq's Tru64 Unix and OpenVMS operating systems plus Linux, while the SC45 supercomputer is Unix-based. Compaq said the ES45 supports up to four of its 64-bit Alpha microprocessors. Pricing for that system starts at $58,000.

Short Takes

Elmwood Park, N.J.-based WEBMD CORP. and Durham, N.C.-based QUINTILES TRANSNATIONAL CORP. settled a privacy-related legal dispute and agreed to drop a data-sharing deal. . . . Brampton, Ontario-based NORTEL NETWORKS CORP. reported a $3.5 billion (U.S.) third-quarter loss, as revenue from continuing operations fell by 45%.

Continued from page 1

Anthrax

tivity, according to a report on the public health infrastructure issued by the Atlanta-based CDC. Another 20% lacked e-mail capability, according to the agency.

Dr. Paul Weisner, director of the Board of Health in DeKalb County, Ga., said a robust IT infrastructure is key to defending against a bioterrorism attack. "Early detection and response is critical, and it all hinges on communications and information technology," he said.

The CDC tapped the suburban Atlanta county for a pilot project to enhance the capabilities of the nationwide Health Alert Network, a secure system intended to eventually connect all public health departments with the CDC. But Weisner said his agency lacks the kind of basic technology that a company such as Atlanta-based United Parcel Service Inc. uses to help its customers track packages.

"We need to get into the modern age of communications," he said. "UPS lets you track a package in real time, but I can't track my emergency room patients in real time. Instead, I have an icon on my desk here that only gives me an update every 24 hours."

Nation at Risk

Symptoms of a sickly public health IT infrastructure:

- **Only half of the country's public health organizations** (3,000 city and county health departments, 3,000 local boards of health and 59 state and territorial health departments) have Internet connectivity.
- **20% of those departments have no e-mail.** In rural states, local health departments predominantly access e-mail through dial-up modems.
- **Lack of secure communications,** combined with regulatory requirements for protecting patient information, forces some state and local labs to communicate their findings by U.S. mail.
- **State and local public health authorities** operate on more than 100 disparate data systems that lack integration, slowing the flow of information and data analysis in times of crisis.
- **Few public health departments** operate on a round-the-clock basis, and few have alert systems such as pagers to contact emergency personnel after normal business hours.

SOURCES: CENTERS FOR DISEASE CONTROL AND PREVENTION, NATIONAL ASSOCIATION OF CITY AND COUNTY HEALTH CARE OFFICERS, DR. MOHAMMAD AKHTER, EXECUTIVE DIRECTOR, AMERICAN PUBLIC HEALTH ASSOCIATION, IN TESTIMONY BEFORE SENATE HEALTH, EDUCATION AND LABOR COMMITTEE, OCT. 9, 2001

Dr. Rex Archer, director of the Kansas City, Mo., health department, said real-time information is needed to track not only emergency room visits, but also other indicators that could signal the spread of a natural or deliberate outbreak of disease.

He said systems should track indicators such as high levels of worker absenteeism and pharmacy visits and then rapidly collate them. The public health system also needs to be able to correlate information from examinations of patients exhibiting the same symptoms so that it can respond to the kind of crisis the nation faces today, he said.

But, Archer added, the public health infrastructure is "woefully inadequate" to handle a major crisis, due to insufficient funding. For example, the CDC has started to deploy a secure information system called the Epidemic Information Exchange (Epi-X), which uses digital certificates to ensure data privacy. But deployment of the full-scale Epi-X system has been restricted to the state level, leaving Archer with a read-only terminal. Archer said he needs the full-scale capability of Epi-X today.

The lack of secure communications systems has forced the Iowa Department of Public Health to send lab reports via mail to protect patient privacy, said Dr. Patricia Quinlisk, Iowa's state epidemiologist, in testimony before a hearing on bioterrorism held Oct. 3 by the Labor, Health and Human Services, and Education subcommittee of the Senate Committee on Appropriations.

Public health agencies also need to integrate their data systems, and Quinlisk has urged Congress to provide $50 million this year for a new CDC project called the National Electronic Surveillance System. That system is designed to integrate as many as 100 separate data systems used by the nation's public health agencies. It would ensure that data analysis can be done rapidly, across data sets and regions, so that mandated reporters such as physicians will find reporting diseases significantly simplified, Quinlisk said.

Archer estimated that Congress needs to beef up the public health infrastructure by about $2 billion this year, with about a quarter of that devoted to improving the IT infrastructure. But Congress has yet to provide any major funding, even for such key systems as the Health Alert Network.

Barbara Govert, a CDC spokeswoman, described the $90 million in funding over the past three years for the nationwide network as "minimal."

"Maybe the events of the past two weeks have made it easier to understand the importance of funding health care infrastructure," she said.

AT A GLANCE

Health Alert Network

- **Launched by Centers for Disease Control and Prevention in 1999** to provide a high-speed, nationwide secure network linking CDC to state and local health departments. Purpose is to boost the level of defense against health threats, including bioterrorism.
- **Enables local health officials nationwide** to access and share disease reports, response plans and CDC diagnostic and treatment guidelines.
- **Provides distance-learning capabilities** through Web-based and satellite technologies to upgrade critical health skills of public health professionals.
- **Provides early warning systems,** such as broadcast fax, to alert local, state and federal authorities about urgent health threats and appropriate responses.
- **Operational in 37 states;** links Centers for Health Preparedness in DeKalb County, Ga., Denver and Monroe County, N.Y. Those centers develop software and test wireless and other technologies.
- **Funding from 1999 through 2001 totaled $90 million.** State and local public health officials say network needs at least $200 million in funding this year.

SOURCES: CDC, NATIONAL ASSOCIATION OF CITY AND COUNTY HEALTH OFFICIALS TESTIMONY AT SENATE LABOR, HEALTH AND HUMAN SERVICES APPROPRIATIONS SUBCOMMITTEE, OCT. 3, 2001

Epi-X Files

The mission of the Epidemic Information Exchange is to help local, state and federal health officials report and discuss disease outbreaks, environmental hazards and other health events as they are identified, investigated and reported. Users include:



Quick Link Anthrax exposure in the Capitol has led to a shutdown:
www.computerworld.com/s/124237

RETURN ON COMMUNICATIONS

ORDERLY NETWORK MIGRATION

The need to move to a new environment.

Chances are, your business has changed since your networks were deployed. You may have implemented new applications. Experienced exceptional growth. Maybe you re-organized or merged. Whatever changes you may have experienced, you can take your networks where they need to go with AT&T's unique combination of Skill, Scale and Scope.

The skill to deliver effective solutions.

With thousands of experienced network professionals, AT&T can support your move to a next generation network.

- Proven systems and processes
- Leading expertise in security and continuity
- World-class Service Level Agreements

The scale to implement globally.

When your company's solution is ready to fly, it can fly virtually everywhere.

- Scalable innovations
- Industry-leading global IP backbone
- Access from 850 cities worldwide

The scope to maximize your return.

AT&T has a wide range of technologies, services and best-of-breed partners to help you manage complexity and change.

- Connectivity services
- Hosting services
- Managed services

It can all add up to a soaring return on your communications investment.



Call AT&T toll free at 1 866 329-1678 or visit us at www.attbusiness.com/return

AT&T

©2001 AT&T

Canadian Bank Moves to Centralize Online Authentication

Web-fraud worries drive $30M security software rollout at financial services firm

BY LUCAS MEARIAN

Concerns about online fraud are prompting Canadian Imperial Bank of Commerce Inc. (CIBC) to invest about $30 million over the next three years to install authentication software aimed at giving its 6 million customers more secure Web access to their accounts.

Analysts said that Toronto-based CIBC is ahead of most financial services firms with its implementation. Customer authentication has become the fastest-growing area of IT spending in the financial services industry, they added.

CIBC is using software, developed by Waltham, Mass.-based Netegrity Inc., that offers security-related features such as single sign-on, user authentication and entitlement management, which governs the applications that different customers can access via the Web.

Andrew Urquhart, lead project manager at CIBC, said the SiteMinder software will eventually be implemented at more than a dozen of the bank's 25 business units. CIBC customers will be able to use the single sign-on feature to tap into various financial services, including retail and commercial banking, online trading and credit card transactions.

For financial services firms, that type of integrated approach to security is "fairly unique," said Dennis Behrman, an analyst at Meridien Research Inc. in Newton, Mass. Many companies face the need to consolidate a hodgepodge of disparate security applications into a single platform that can be centrally managed, he said.

Centralizing functions, such as online user authentication, can reduce IT costs and tighten security, according to Behrman. "If I'm managing eight systems, there are eight chances those systems could be compromised," he said.

CIBC, which has $180 billion in assets, is trying to eliminate its own hodgepodge approach. The project first began taking shape two years ago, when John Hunkin took over as the bank's chairman and CEO. He initiated a program to give customers greater access to their accounts through devices such as PCs and interactive voice response systems.

Quest for Consistency

Previously, business units handled their own software development, "sometimes coordinating on the project, sometimes not," Urquhart said. "I'm not going to suggest our applications aren't secure, but what this [software] provides is a starting point where there's a consistent level of security across our organization."

It also reflects how CIBC is widely viewed as an IT leader. Jerry Silva, an analyst at Needham, Mass.-based TowerGroup, said CIBC is considered among the top 10 technology innovators out of thousands of financial services firms.

While CIBC hasn't developed a solid return-on-investment model for the security initiative, Urquhart said it's expected to deliver some immediate IT cost savings and help the bank attract more customers and retain a higher percentage of them.

In addition, a feature that lets users reset their passwords should keep CIBC from having to increase head count in its

Call 1-800-OK-CANON ext. 50 or visit www.imagerunner.com



A box that delivers paper documents anywhere overnight?

Introducing the Canon imageRUNNER with document distribution technology. Now you can send paper documents anywhere, in any form, at anytime, right over your network or the Internet. Instantaneously. Simply scan a document into the imageRUNNER 5000, and you can send it to any desktop, e-mail address, fax machine, database or file server. And since the Canon imageRUNNER is capable of integrating directly with your existing e-mail, lanfax,

*Requires additional software which is sold separately. Speak to your authorized Canon dealer.
Canon is a registered trademark and IMAGERUNNER and Canon Know How are trademarks of Canon Inc. IMAGEANYWARE is a service mark of Canon U.S.A., Inc. ©2001 Canon U.S.A., Inc.

call centers "to support the growth of the [online] business," Urquhart said.

In CIBC's case, SiteMinder will reside on Sun Microsystems Inc. servers aod match user names with databases or directories of entitlements io-formation to determine what applications and data customers can access. The bank is installing four new servers in its data ceoter to run the software and mirroring them with four other systems in a backup facility.

The first implementatioo of the software is in the works for CIBC's online retail banking applicatioos, Urquhart said. The single sign-on feature is due to he rolled out in December and should be followed by the password reset capability next June, he added.

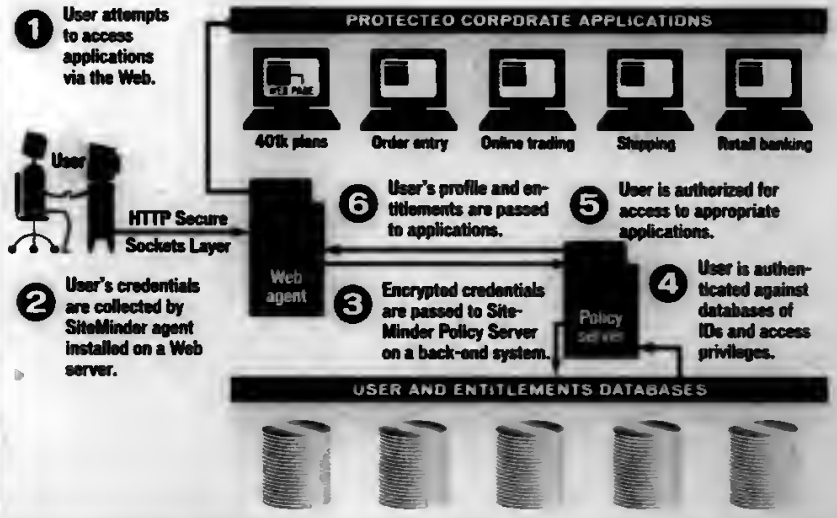
As the project proceeds, CIBC will add single sign-on capability for its PC banking service and its Imperial Service, which is aimed at high-end customers. The SiteMinder application will also be installed in areas such as small business and commercial banking, private banking, credit card processing and brokerage services, Urquhart said.

The software installatioo itself has been relatively trouble-free, Urquhart said. But getting executives at the different business units to agree on commoo security policies has beeo a bigger challenge, he added. That process will likely take about four more months to complete, Urquhart said.

"You can put the technology in fairly easily, but if your businesses are not in line, they'll just break down behind the scenes," he said.

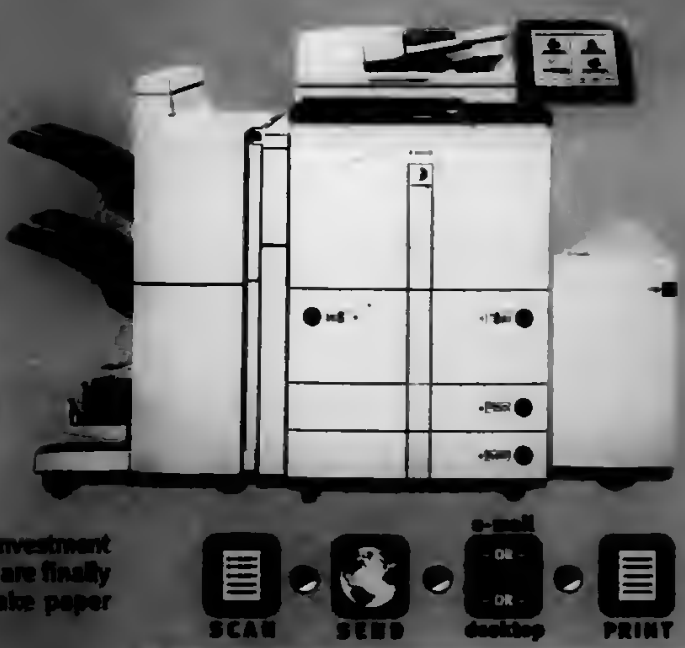
Authentication in Action

How Netegrity's SiteMinder software works:



imageRUNNER™ 5000

Or a box that delivers them instantly over the internet?



and document management software, you can maximize your investment in these systems*. The cost and hassle of overnight delivery are finally gone. At Canon, we've giving people the know-how to make paper documents work in an internet world.

Canon KNOW HOW™

Supply Chain Apps Target Complex Orders

Software vendors ready new tools for users working with multiple suppliers

BY MARC L. SONGINI

Supply chain software vendors i2 Technologies Inc. and Yantra Corp. are rolling out rival applications designed for users who need to manage complex order-fulfillment processes involving multiple business units or suppliers.

Dallas-based i2 confirmed that it plans this week to announce a new line of order management tools as part of an upgrade of its flagship supply chain suite, called i2 Five.Two. The company declined to comment further on the plans.

Karen Peterson, an analyst at Stamford, Conn.-based Gartner Inc., said i2 is positioning the new technology for use in integrating multiple order management systems.

Meanwhile, Yantra last week released the latest version of its namesake multienterprise order and inveotory management software.

Yantra Versioo 4.0 includes new supply chain collaboration, catalog management and workflow visualization features, officials at the Tewksbury, Mass.-based said. The new version of the software also includes embedded application server software developed by San Jose-based BEA Systems Inc.

Unifying Software

Enterprise resource planning vendors such as SAP AG and Oracle Corp. also claim to have technology that offers order visibility and dynamic management capabilities across supply chains.

But their products typically handle orders for a single business unit or company, said Chris Newton, an analyst at AMR Research Ioc. in Boston. By contrast, the software developed by Yantra and i2 can sit between transactional systems and act in "a unifying way to bring together disparate organizations," Newton said.

APL Direct Logistics, a third-party logistics provider in Jacksonville, Fla., is one of about 40 companies that have installed earlier versions of Yantra's software. The applications let APL offer a wider range of services to potential corporate customers, said Sally Miller, director of IT.

Miller said the software costs about $850,000. APL started using it in March, replacing an internal system that didn't have alternative sourcing or back-order management capabilities. But, Miller said, her company could still use tools that would automate the calculation of domestic and international taxes and speed up the process of returning and exchanging inventory.

AT A GLANCE

Await Orders

Order management software:

Is designed to help users coordinate and manage inventory orders through multiple channels, business units and suppliers.

Offers benefits such as cost savings, reduced order-fulfillment times and faster supply chain responses to shifts in customer demand

Logistics and transportation services provider Ryder System Inc. uses a mix of applications from vendors such as Atlanta-based Viewlocity Inc. to manage "order-impacting eveots" in its supply chain, said John Wormwood, group manager of e-commerce at Miami-based Ryder. The software helps with challenges such as order changes and sourcing problems, he added. ▶



BRIEFS

IBM's Sales, Profits Fall in Third Quarter

IBM reported a $1.6 billion net profit for the third quarter, down 18% from income of $1.96 billion in the same period last year. Third-quarter revenue came in at $20.4 billion, dropping 6% from $21.8 billion a year ago. IBM said predictions by financial analysts of a fourth-quarter profit in the $2.4 billion range appear to be "reasonable."

Chip Shipments Rise, But Intel Results Off

Despite an increase in microprocessor shipments, Intel Corp. reported a 96% year-to-year decline in third-quarter profits and a 25% drop-off in revenue. Price cuts offset the rise in chip shipments, said Intel, which had net income of $106 million on revenue of $6.6 billion. The company forecast a similar revenue level during the fourth quarter.

AT&T, BT Break Up Joint Venture

AT&T Corp. and London-based British Telecommunications PLC agreed to dissolve their Concert joint venture, which offered global networking services to multinational companies. AT&T and British Telecom will take back the various assets they each put into the venture. But they said all of Concert's contracts and service-level agreements will be honored.

Short Takes

MICROSOFT CORP. and NEC CORP. announced plans to work together to develop high-end Windows servers as well as Web services that would run on the systems and utilize Microsoft's .Net technology. NEC would sell the servers. . . . Blue Bell, Pa.-based UNISYS CORP. said it will eliminate 3,000 more jobs and take other cost-cutting actions after its third-quarter income fell 53% from last year's level.

Wal-Mart Deal Boosts IBM in Storage Wars

Mainframe and disk array contract heats up competition with EMC

BY LUCAS MEARIAN

WAL-MART Stores Inc. is upgrading its mainframes and tying IBM disk arrays to the machines in a multimillion-dollar project that analysts described as a big win in IBM's effort to regain some of the storage market share it has lost in recent years to now-struggling EMC Corp.

The project, which is estimated to cost up to $50 million, replaces a series of S/390 mainframes with IBM's newer z900 systems.

Bentooville, Ark.-based Wal-Mart is also installing IBM Shark disk arrays with a total storage capacity of 50TB to support the mainframes, which run core business applications such as invoicing, product replenishment and the processing of credit card transactions for the retail giant's 4,000-plus stores.

IBM's announcement of the deal last week coincided with a disclosure by Hopkinton, Mass.-based EMC that it lost $945 million in the third quarter as revenue plunged 47% oo a year-to-year basis (see box).

Wal-Mart officials declined to identify any storage vendors that are being replaced as part of the Shark installation.

But IBM said the Shark arrays, known formally as Enterprise Storage Servers, will take over data center processing jobs done previously by storage devices from EMC and Santa Clara, Calif.-based Hitachi Data Systems Corp.

Wal-Mart's decision is a sign that IBM has overcome earlier performance problems with the Shark array, analysts said.

"Early information we were getting from the field was that Shark's performance was horrible and it couldn't grow capacity beyond a certain poiot," said Arun Taneja, an analyst at The Enterprise Storage Group Inc. io Milford, Mass. But those issues now appear to have been irooed out, he said.

Mike Kahn, an analyst at The Clipper Group Inc. in Wellesley, Mass., said the Wal-Mart contract significantly turns up the heat on EMC.

Last year, EMC had 19.1% of the overall storage market, followed by Compaq Computer Corp. with 18.7% and IBM with 13.3%, according to Gartner Inc.'s San Jose-based Dataquest Inc. unit.

But "without any question, EMC has more competition today, and their competition is getting stronger," said Dataquest analyst Roger Cox.

Despite IBM's mainframe storage win, EMC said Wal-Mart is still a big user of its disk arrays. EMC said its products have been deployed across multiple server platforms at Wal-Mart, including Unix and Windows NT systems tied together via a networked storage architecture. ▶

Tough Times At EMC

The once-high-flying storage vendor lost much:

- **Reported** a $945 million third-quarter loss oo revenue of $1.2 billion, down from year-earlier revenue of $2.3 billion.
- **Took** an $825 million pretax restructuring charge to pay for layoffs, facility closings and inventory write-downs.
- **Increased** the number of employees being let go under a cutback program announced last month from 2,400 people to 4,000.

B2B Vendors Take More Hits as Sales Drop

Rivals look for new ways to improve software revenue

BY MICHAEL MEEHAN

Steep revenue declines, layoffs and managemeot changes: That's the way it has been all year for business-to-business software vendors, and last week brought more of the same for three top rivals.

Pleaaaoton, Calif.-based Commerce One Inc. and Dallas-based i2 Technologies Inc. announced big third-quarter losses and more job cuts. Sunnyvale, Calif.-based Ariba Inc. named a new CEO, the third person to hold that job this year. Ariba also said revenue for its fourth quarter ended Sept. 30 will be down sharply year to year, though slightly above earlier estimates.

John Fontanella, an analyst at AMR Research Inc. in Boston, said B2B vendors are being squeezed as SAP AG and other makers of back-office software build similar functionality into their applications. In addition, he said, many users are looking to buy individual business-to-business modules instead of full product suites.

Commerce One CEO Mark Hoffman vowed to continue investing aggressively in collaborative commerce applications. But SAP will take over much of Commerce One's sales, Hoffman said, adding that his company's software is frequently being bundled with SAP's business applications.

In June, SAP upped its ownership stake in Commerce One from 4% to 20% by investing $225 million in the struggling company. Fontanella said he doesn't expect SAP to buy out its partner at this point. But working closely with SAP is a good strategy for Commerce One to pursue, he said.

12, which also sells supply chain applications, is looking for a boost from a new release called i2 Five.Two, whicb is due out this week. But big supply chain projects "are out of vogue now, and i2 doesn't have much else to fall back on," said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif.

Ariba is pinning its hopes for a rebound on what it calls "spend management" products aimed at helping users rein in expenses. New CEO Robert Calderoni even tried to distance Ariba from the term business-to-business, saying it's now focused on corporate spending practices. ▶

JUST THE FACTS

Three of A Kind

Last week's announcements by B2B vendors included the following:

- **Commerce One reported a $119 million third-quarter loss and said it will cut 1,300 of its 2,800 workers through layoffs or business spin-offs.**
- **i2 Technologies reported a $5.5 billion net loss for the third quarter and announced a new round of layoffs that will affect about 1,000 employees.**
- **Ariba named its third CEO this year and disclosed that its fiscal fourth-quarter revenue will be less than half the year-earlier total.**


Cripes, you networked
your grandma last year.
Isn't it time you networked
your data center?

Introducing the Sun Fire™ 15K, the mainframe-class server for today's networked data center.

Go beyond the mainframe. Way beyond.

Mainframes have been the standard in the glasshouse since the '70s. But with their complexity, closed technology and high maintenance costs, mainframes are simply not designed for the modern networked data center. The Sun Fire™ 15K server, on the other hand, has the power to run the most demanding applications – at a fraction of the cost of a UNIX® system or mainframe.

Ah, the joy of consolidation.

In fact, the Sun Fire 15K server is so powerful, you can consolidate multiple servers and rehost mainframe applications, as well as deploy new mission-critical applications in an open environment. And unlike a mainframe, the Sun Fire 15K server easily integrates into your existing architecture. The Sun Fire 15K server has complete end-to-end system compatibility with the Solaris™/SPARC™ architecture, so you use the same tools, applications, administration and resources to deploy and manage it. No recoding, no retraining and no expensive consultants to come in and "manage" it for you.

A revolutionary concept in data centers: reduced costs.

The result of all this? A significantly lower total cost of ownership. In the end, by incorporating the new Sun Fire 15K server into your existing architecture, you can reduce your data center's complexity, take control and cut your costs. So take the first step toward liberating your data center–and your bottom line. **www.sun.com**



Product specifications (the rocket science):

- 106 CPUs – the largest in a single cabinet
- 1/2 terabyte memory – enough to run a database in main memory
- 18 domains – for the utmost in balanced workloads
- 4 petabytes of storage - 20x the Library of Congress
- 6,400 mainframe MIPS - 3x the IBM z900
- 5th-generation fault-isolated dynamic system domains
- Sun™ Fireplane interconnect – maximum app performance
- Uniboard design – swappable CPU and memory board

Independent software vendor support:

Sun offers software developers an unparalleled open and compatible architecture in which to develop and deploy their solutions. This single integrated system architecture allows customers to protect their investments, leverage their existing skill sets and staff, and increase their ROI. It's the reason ISVs like BEA Systems, i2, J.D. Edwards, Oracle and VERITAS partner with Sun.

take it to the n[th] Sun microsystems

MARYFRAN JOHNSON

Don't Dis Storage

INFRASTRUCTURE is cool again. The back end is back in vogue. And data storage rivals security as a hot tech topic today.

Unlike the past few waves of technohype, this is no Y2k call to arms. It's no strategic e-commerce gamble, either. Your senior business managers are never going to care about storage. As one IT executive said to me last week, "If you're talking to senior management about storage, you're having the wrong conversation."



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

The only thing that will even remotely interest your CEO is the price tag — and how it relates to a project's business benefits.

That doesn't let you off the hook, as was evident in our Storage Knowledge Center special report in last week's issue (also online at *Computerworld.com*). All the familiar pitfalls were covered: overpriced software, incompatible technologies and conflicting expert advice.

One of our stories ("Oops!" by Sami Lais) detailed all the storage mistakes that IT can stumble into and suggested ways to avoid them. It was quite a daunting list. You can get too bogged down in the technology and forget business requirements before you buy. You can overlook network traffic needs. You can get too focused on online storage and neglect your off-line backup strategy. You can fumble the complex job of integration and end up with outsourcers running your life.

Or you can seize the storage day and take control.

"Our biggest issue right now is dealing with vendors who are going around central procurement and getting into the business units. We're going to stop that," said George Vrabel, a senior IT vice president at Bank of America. The bank is expecting a 25% growth rate in its massive storage capacity this year. Yet even a giant like Bank of America encounters the same problems every company does on the storage frontier: product interoperability snafus, lack of maturity in distributed management tools and a struggle to make the cost/benefit analysis work.

Perhaps that's cold comfort, knowing that everybody's in the same boat. But remember that the deeply technical nature of networked storage makes it an IT infrastructure play from start to finish. So the next time you bump into the CEO, ask about his golf game. ◗



PIMM FOX

A Congressional Boost for IT?

IT'S TIME to shake that IT depression. If you've been denied budget approval for new equipment or an operating system shift, now is a good time to dust off those proposals. Washington lawmakers are debating changes in the depreciation schedule for IT that could cut the cost of buying new hardware and software.

When Congress first set the five-year depreciation schedule for IT in 1981, which it accelerated slightly in 1986, IBM had just shipped its Personal Computer with 16KB of RAM, a 4.77-MHz 8088 processor and a cassette interface, all for $3,000.



PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

The problem? According to today's tax rules, it would take a company at least five years to write off that machine — and every PC built since then.

IT may have changed from the days of the IBM PC, but the tax code remains stuck in a time warp.

Fortuitously, as part of President Bush's economic stimulus package, there's a chance businesses could write off purchases of computers, software, high-tech equipment and even cell phones on an accelerated basis — say three years max.

In a mid-October meeting with House Ways and Means Committee Chairman Bill Thomas (R-Calif.), Harris Miller, president of the Information Technology Association of America, called for accelerated depreciation of computers, software, telecommunications and other equipment "at a rate that reflects the modern business environment." Miller said depreciation rules are out of line with reality, since hardware and software have shelf lives seemingly only slightly longer than mayflies. "If we get a more realistic depreciation schedule that reflects the useful life of products, purchasers will move more quickly, giving a boost to the IT industry," he said.

The prognosis for success is good. Particularly if you e-mail your local congressman to support this tax code change.

But a nagging question remains: How receptive are IT buyers to new purchases?

The answer is surprising.

According to an AFCOM Data Center Institute

Quick Link For more *Computerworld* columnists and links to archives of previous columns, head to. www.computerworld.com/q?q1000

poll conducted after Sept. 11, an overwhelming 94% of 422 senior data center managers surveyed said the terrorist attacks haven't caused them to cut spending. In addition, 53% — compared with 67% in a first-quarter poll — of the largest data centers report IT purchasing plans remain the same or are increasing for the next 12 months.

Despite the combination of gloomy economic reports and war-related news, almost half of the IT executives — 48% — said changes in the economy had no effect on their application implementation plans, while 16% said they are accelerating their implementations.

With a tax code more in sync with Moore's Law and confident IT buyers, we might shrug off the worst of the high-tech blues.

MICHAEL GARTENBERG

Why Ubiquitous Computing Will Supplant the PC

THE PC HAS maintained a dominant position on the desktop and achieved a level of nonsubstitutable infrastructure, making it difficult, if not impossible, to replace. Wintel systems benefit from the image of being the safe choice in many market sectors, with the result being a powerful positive feedback loop. Despite this, it's inevitable that the PC will be replaced, and IT departments need to start thinking about what might come tomorrow. To understand the shift that will occur, understand that nearly all technology shifts take place over time and go through the following five phases:



MICHAEL GARTENBERG, a former vice president and research area director at Gartner Inc., is an independent technology analyst and consultant. Contact him at mikeal. gartenberg@mikeloping.com.

1. Competing standards are introduced.
2. Market forces lead to one standard emerging as nonsubstitutable infrastructure.
3. The prevailing standard is attacked by pseudochallengers but isn't displaced because the challengers don't offer enough meaningful differentiation or have flaws different from the technology they try to displace. (However, pseudochallengers often have enough value to remain viable alternatives.)
4. The standard re-emerges stronger than before and appears invincible.
5. A new and better technology emerges and displaces the existing standard.

This cycle has held true for a variety of technical innovations, from the development of refrigeration to audio technologies. The Wintel PC is now going through stages 3 and 4. It has achieved dominance and faces a host of pseudochallengers. Throughout the years, these challenges have included the Mac OS, OS/2, Linux, Java and network computing. But none was able to cross the gap that leads into the fifth stage by providing a clear and demonstrable difference. Despite being unable to displace the Wintel PC, many of the challengers provide enough value to remain viable alternatives in certain markets.

To supplant existing technology, a new technology must meet the following three criteria:
1. It must offer visible and demonstrable value and differentiation that end users can directly exploit. One reason the CD replaced the LP so quickly was that end users were able to clearly *hear* the difference between the two technologies.
2. It must offer economic benefit to software vendors. In the CD market, software vendors — in this case music companies — had a clear benefit to shift to the new format since the retail price they could charge for a CD was much higher than that of an LP or cassette and has remained so.
3. It must offer clear economic benefit to hardware vendors. If conditions 1 and 2 are met, hardware vendors have a strong incentive to build new systems that will take advantage of the new technology and drive upgrades. CD hardware vendors were behind the new audio technology and had no fears of systems cannibalizing sales.

Today, we're seeing the rise of a technology that meets these criteria: ubiquitous computing. Ubiquitous computing is the ability to access useful digital content, both personal and business-related, through a variety of digital information devices. By 2005, it will evolve and ultimately displace the PC on the desktop.

Three core components will enable ubiquitous computing: a multitude of information devices; connectivity between personal-area networks, wireless LANs and WANs; and Web-based services that provide the software infrastructure. In future columns, I'll discuss each of these components and explore how the PC will evolve.

READERS' LETTERS

MCSEs Sound Off

IT'S ABOUT TIME Microsoft woke up to the reality that many weren't going to play the certification game on its terms anymore ["Users Force Microsoft's Hand," Page One, Oct. 15]. I decided early on that I wouldn't recertify under Windows 2000. Now that the pressure is off, I may even recertify after all.

Lyle Cashman
Network design engineer
Gerber Technology
Tolland, Conn.

WHILE THIS announcement is good news, I'm still considerably ticked at Microsoft for making the capricious decision that individuals who had used the Windows 95 or 98 tests as part of their certification weren't worthy to take the accelerated test to update their MCSE to Windows 2000 status. It convinced me to get off the vendor certification treadmill and seek industry-standard certs; I passed my CISSP test last February. Windows server platforms are my area of expertise, particularly in the Internet-exposed environment. Naturally, I have extended my knowledge to Windows 2000. I suspect I'll eventually seek further certifications from Microsoft, as I know these are HR check boxes, but it won't happen without considerable muttering under my breath.

Dave Schulhoff
El Dorado Hills, Calif.
dschulhoff@compuserve.com

THIS REALLY ticks me off. I was in a one-year course aimed toward the MCSE NT certification when Microsoft announced it was retiring the required test to become MCSE-certified in NT 4.0. I finished the remaining courses mainly for my own satisfaction and because I had already invested over $1,000. Now, 10 months later, Microsoft announces it will still recognize the NT 4.0 cert. Ten months ago, not all the tests were retired yet and I could have at least become an MCP.

Jan W. Saurbaugh
U.S. Coast Guard
Baltimore

Lowdown on Uptime

VISA'S 98 minutes of downtime in 12 years calculates to 99.9984% uptime on my Excel spreadsheet. Impressive, but not five 9s ["When Five 9s Aren't Enough," Technology, Oct. 8]. But given the arithmetic on some credit card bills . . . (This was a really good and informative article; I just couldn't resist.)

Richard Elswirth
Raleigh, N.C.

Update Thyself

IN A SEPT. 24 interview ["Resolving Windows Insecurities," Technology, Sept. 24], Microsoft's Steve Lipner's general tone seemed to say, "It's up to you to make your PC secure," but his insistence that users rely on the *Windowsupdate.microsoft.com* site had me in stitches. Not five minutes before reading this article, I had tried to open this Web site and got a runtime error, "204: HomeMenu not defined." I use Internet Explorer 5.5, Service Pack 2, so I feel I am relatively up-to-date. How is the general consumer supposed to keep his PC up-to-date when Microsoft's own site can't accomplish this doesn't work?

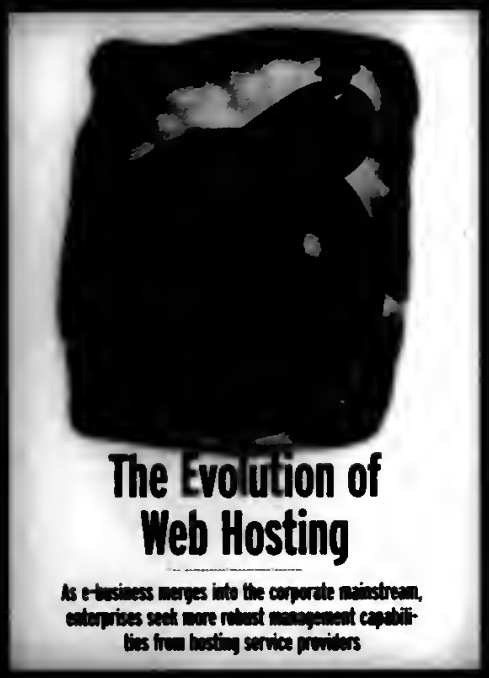
Jim Gilbert
Consultant
Ciber Inc.
St. Louis

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4643. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

Quick Link For more letters on these and other topics, visit our Web site. www.computerworld.com/s/?s8000

Don't miss the IDC White Paper on "The Evolution of Web Hosting" featured in Computerworld's October 29 issue.

White Paper



Sponsored by:

digex

www.digex.com

White Paper



The Economics of a Storage Strategy

Even in today's tough economy, creating and executing a comprehensive storage strategy can mean competitive advantage and significant financial gain

COMPUTERWORLD





click.

Add storage and content without adding more racks. With help from DataCore. Our SANsymphony™ software virtualizes storage, creating shared pools from any networked assets. So you can use storage from one server to alleviate the growing pains of another. For more on virtualization, read our free white paper at www.datacore.com/click. After all, the best way to solve your storage problem is to keep it from ever becoming one.

DataCore
SOFTWARE

© 2001 DataCore Software Corporation.

The Economics of a Storage Strategy

Even in today's tough economy, creating and executing a comprehensive storage strategy can mean competitive advantage and significant financial gain

Some believe that making a storage acquisition should be a simple decision — if you need additional capacity, you merely buy more. When economic times are tough, the purchasing is deferred and everyone has to get by.

By Randy Kerns
Senior Partner
Evaluator Group Inc

This is bad reasoning and an example of poor business understanding. First, storage acquisition needs to be part of a larger storage strategy. Second, the economics of the acquisition are part of that strategy and should be based on a sound business decision regardless of the economic climate. In fact, the storage strategy should demonstrate the positive contribution to the corporate economic condition. The issue comes down to convincing executives of the importance of having a storage strategy, and to making the correct economic decisions.

Why is storage so important right now? There are several reasons. First, there's a significant financial investment in storage. The size of that investment is being driven by the growth requirement in storing data, and is a massive line item in most organizations' expenditures.

Also, the protection and availability of data are strategically important to a company. The data is important to the day to day operations, of course; in addition, using derived information as a competitive business advantage is vital. Data is vital to a business, and storage and retrieval are considered basic operational requirements for all businesses. The criticality of storage in normal business operation warrants having a storage strategy. A storage strategy is much more than an acquisition strategy. It must encompass all aspects of storing and retrieving data:

- The connectivity methodology for computing elements to have

The Economics of a Storage Strategy

Even in today's tough economy, creating and executing a comprehensive storage strategy can mean competitive advantage and significant financial gain

By Randy Kerns
Senior Partner
Evaluator Group Inc

Abstract

Storing and accessing data is a necessity in today's business environment. The continued growth of corporate data has made it extremely important to have a comprehensive storage strategy. The good news is that even in today's tough economy, executing that strategy can mean an investment in technology that has the potential for significant financial gains for a company.

This white paper will help you understand the business requirements necessary for developing a storage strategy that is a sound business practice with economic gains to be realized.

Some believe that making a storage acquisition should be a simple decision — if you need additional capacity, you merely buy more. When economic times are tough, the purchasing is deferred and everyone has to get by.

This is bad reasoning and an example of poor business understanding. First, storage acquisition needs to be part of a larger storage strategy. Second, the economics of the acquisition are part of that strategy and should be based on a sound business decision regardless of the economic climate. In fact, the storage strategy should demonstrate the positive contribution to the corporate economic condition. The issue comes down to convincing executives of the importance of having a storage strategy, and to making the correct economic decisions.

Why is storage so important right now? There are several reasons. First, there's a significant financial investment in storage. The size of that investment is being driven by the growth requirement in storing data, and is a massive line item in most organizations' expenditures.

Also, the protection and availability of data are strategically important to a company. The data is important to the day-to-day operations, of course, in addition, using derived information as a competitive business advantage is vital. Data is vital to a business, and storage and retrieval are considered basic operational requirements for all businesses. The criticality of storage in normal business operation warrants having a storage strategy. A storage strategy is much more than an acquisition strategy. It must encompass all aspects of storing and retrieving data.

- The connectivity methodology for computing elements to have

access to data.

- The security and integrity required for corporate data
- The performance demands for data access in processing
- The capacity scaling requirements to support future business demands
- A set of guidelines for dealing with storage vendors, including storage management software
- A rolling multi year plan for adoption of new technologies that have economic benefit
- A plan for archiving and retaining electronic records used for legal compliance

Implicit in all storage issues are the economics involved. Multiple factors of concern are usually grouped in a Total Cost of Ownership (TCO) model that includes acquisition cost, administration, support, environment, etc. This is sometimes confused with Return On Investment (ROI), which is a comparative model that demonstrates when an investment has paid for itself in cost savings. Using an ROI model can demonstrate the very straightforward value in a particular decision, but a long term storage strategy requires an extended horizon that looks at overall business issues.

To examine the economics in a storage strategy, the dynamics of what is happening in the storage discipline must be understood. First is a thorough understanding of what's driving the demand for storage, and the implications that brings. Business issues that are part of the growth requirement must be considered as well. There are many solutions in the market today, with many more being promised by high profile vendors. How these solutions address problems and how they will change over time are factors in developing a strategy. Finally, the hard economics of executing a storage strategy must be researched. Strategic storage decisions have long term repercussions and can have impact (both positive and negative) on companies and careers.

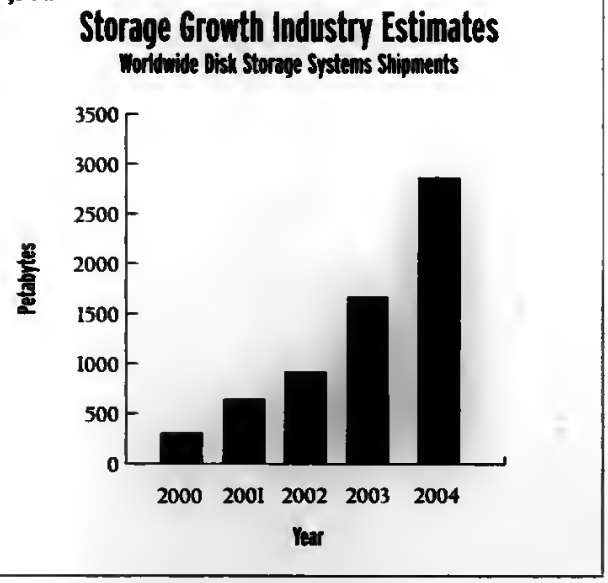
Addressing growth

Customers have a major problem with storage today: the growth of data that needs to be stored and retrieved. Today, most IT organizations are experiencing phenomenal growth of storage needs, often doubling capacity each year. There are many reasons for this growth, including the following:

- More applications are being brought online, this can be thought of as normal business activity.
- The growth of e-commerce is impacting storage capacity. Most e-business initiatives in corporations are net additions to the storage requirements beyond existing business data processing. The amount of storage needed to support e-business has been staggering to date. The expansion of e-business is expected to continue for several years, fueling the continued growth of storage in that area.

Just a few years ago, businesses typically kept three months of data online and immediately accessible. Now, that number is averaging seven

Figure 1:







TWO IS BETTER THAN ONE.

GADZOOX DELIVERS THE POWER OF TWO.

A 2Gb Open Fabric Fibre Channel Switch
For The Price Of 1Gb

gadzoox NETWORKS

Finally, a fabric switch that plays well with everyone.

Looking for the best value in next-generation fabric switches? Feast your eyes on Gadzoox Networks' Slingshot. An open fabric switch for companies that not only have a healthy appetite for storage, but appreciate a great value when they see one. We're talking double the performance with a cool 2Gb throughput with full-duplex support, all for less than a 1Gb switch today. Industry-leading FC-SW-2 open standards, legacy Brocade connectivity, auto-sensing for loop or fabric, and auto-negotiation for 2Gb or 1Gb ports ensure backward and forward compatibility for existing full fabric and loop devices. And as you might expect, Slingshot seamlessly integrates into backup solutions from all leading vendors.

Gadzoox Networks' Slingshot — the one SAN solution that has everything else in the category licked.

Want to learn more? Visit our website at www.gadzoox.com/slingshot or call Gadzoox Networks sales at 888.423.3222 today.

© 2001 Gadzoox Networks, Inc. All rights reserved. Gadzoox and the Gadzoox Networks logo are registered trademarks of Gadzoox Networks, Inc.
Slingshot is a trademark of Gadzoox Networks, Inc. All other trademarks or registered trademarks mentioned herein belong to their respective holders.



years' worth of data. Having data immediately accessible addresses both business issues and potential legal requirements. From a business standpoint, the time required to access data may represent an informed decision being made in a timely manner, a customer being satisfied (or lost), and money expended while waiting for information. Certain legal implications exist regarding retention of data with a "reasonable" availability, meaning retrieval time.

Dramatic growth

In the last five years, the amount of the world's information being stored electronically has risen from 1% to 10%. This is a dramatic change, and a portent of further change, simply reaching the 20% level will require a quantum leap in storage capacity. Figure 1 shows the growth of storage based on disk drive shipments, with a projection for the future.

As if that weren't dramatic enough, storage growth is compounding. As an example, consider a data center that's adding 1 terabyte of storage this year in order to meet demands. If growth continues as expected for the next five years, that data center will be adding 32 terabytes in the fifth year. Adding the capacity itself is just one of many issues, others include environmental concerns, physical space, and connectivity infrastructure.

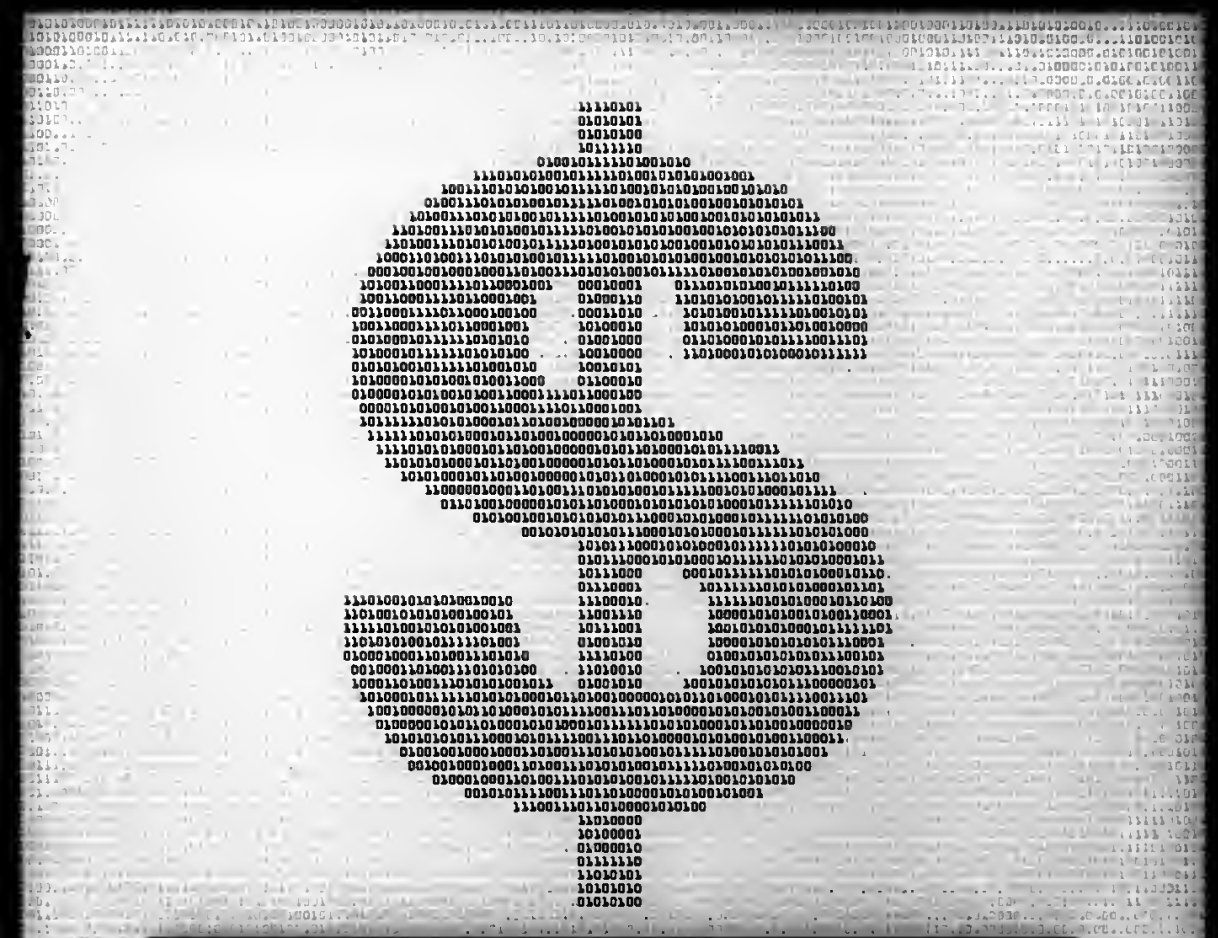
But the Number One issue with storage is the cost of administration. With the growth in storage, the cost of administration is scaling linearly. A study has shown that the cost of managing 1 terabyte of data is 300% to 700% that of purchasing it. The reason for high administrative costs is that there are almost no consistent, multi-platform tools. Indeed, storage is typically administered on an individual device basis, where different tools are used for each type of device. There is no overall tool set, and trained administrators are required. Today, there's a severe shortage of trained administrators — despite corporate downsizing.

The cost of administration varies depending on where storage is administered. Systems that are distributed are administered independently and, typically, by personnel who are not storage professionals with the training and tools that may be necessary to be efficient. This inherently costs more than centrally located systems with a professional staff. Systems that have a high degree of integration (meaning they are not independent systems physically located together) can be more efficiently administered. This equates to a metric that is actually relatively simple to understand: the amount of storage an administrator can manage, or Gigabytes per Administrator.

Reaching the limit

Considering the demand for growth in storage, without some commensurate change in the amount of storage an administrator can manage, the ability to find (and hire) administrators is a limiting factor on satisfying storage demand. Many storage management solutions that are being delivered or promised are focused on increasing the amount of

There's no question that today, most IT organizations are experiencing phenomenal growth in their storage needs, often doubling capacity each year. The principal reason: The amount of storage needed to support e-commerce and e-business has proven staggering.



BrightStor™ Storage Management Solutions

For years, storage management has been an ever-increasing cost, not a source of potential opportunity. But that's all about to change. Because we've created BrightStor, the most comprehensive suite of end-to-end storage management solutions on the market. BrightStor lets you leverage your resources and data across your entire enterprise, regardless of platform or protocol. In fact, BrightStor is the only suite of solutions that supports all three industry models—DAS, NAS and SAN—cross-platform. Which means you can look at your eBusiness needs as a whole, not piece by piece. So you can optimize your resources across your entire storage infrastructure. And, most importantly, you can do more than just store information. You can actually use it.

ca

Computer Associates™

HELLO TOMORROW | WE ARE COMPUTER ASSOCIATES | THE SOFTWARE THAT MANAGES eBUSINESS™ ca.com/storage

©2001 Computer Associates International, Inc. (CA). All trademarks, trade names, service marks, and logos referenced herein belong to their respective companies.

With the skyrocketing growth in demand for storage, the abiiity to find and hire administrators has become a limiting factor. Many of today's storage management soiutions (as weii as tomorrow's) promise to address this by increasing the amount of storage that can be handled by a given administrator.

storage that can be managed per administrator, it's the dominant factor in the economics of storage growth, and is a focus item for nearly every vendor company This will be explored more in a later section

If the ability to store and access data is impeded for some reason, such as an insufficient number of administrators, there are major implications for the business itself. The business imperatives enabled by storage have some very visible effects on the company financial position if storage can't be deployed in a timely fashion, new or additional business will have to wait, which will negatively affect revenue. Customers may be lost, and opportunities might not appear in the same timeframe. Adding storage is not as simple as buying more and plugging it in It must he administered in an ongoing manner Managing the storage has both human and software costs Additionally, the process of acquiting storage is not free either — it consumes time and people

For these reasons, the acquisition of storage needs to be more than just a "box" purchase It should, rather, be part of the enterprise storage strategy

Solutions in the market

There are various vendor solutions available today to address the growth of data storage requirements. In addition, vendors promise many fresh solutions soon. The solutions encompass several approaches and have different economic values depending on their applicability. Of course, any potential solution must address an immediate problem, but their value must be examined in a larger context as well To understand the wide variety of solutions, they must be analyzed and put in perspective.

Before we look at the solutions to the storage problem, we first need to categorize the different environments They are significantly different This difference has to do with what the original objectives were for these systems and how they subsequently evolved. It would be easier if there weren't a difference, but there are many — and that leads to a different set of decision criteria. It should be pointed out that efforts to change environments have not been very practical or cost efficient. Over time, evolution is bringing the environments closer together, and at some point they will merge.

Windows NT/2000 and the many versions of UNIX represent the open systems area There is incredible diversity in these systems, such that hardware and software solutions may not operate on all of them

In contrast, IBM dominates the mainframe world with its MVS OS/390 z/OS operating system, and there's no question that software or hardware targeted at that market must integrate fully into the IBM environment

The lack of mature, common sets of tools for the management of heterogeneous platforms is a significant problem for storage professionals today, and increasing the amount of storage an administrator can manage is an area of intense vendor focus

Part of laying this foundation or background to the storage problem is understanding how storage is connected to the servers that will execute the programs. The most common method has been a direct attached



High Speed Serverless Backup





storage (DAS) model. In this model, the storage is connected through an interface, such as SCSI or fibre channel, that runs some command protocol. (In the open systems world, the command protocol is also called SCSI, which often leads to significant confusion.) In direct attached storage, Input/Output is done in blocks from the server to the storage. This type of attachment has set the standard for performance and utilization by the server. With DAS, performance is typically characterized by response time for access to data and by bandwidth for aggregate transfer rate of data.

A more recent storage option is network attached storage. NAS allows a file system to be handled remotely. So rather than having the server on which the application runs use the local file system to drive block I/O to an attached device, as with DAS, redirector software sends the file request over a LAN to another computing element (the NAS device), where it turns the file access to a block I/O to a disk system that it controls. It's really a remote file system.

NAS issues include the overhead for using the LAN (the TCP/IP protocol stack and other processing involved) and the added latency that comes when another processing element is placed in the I/O access path.

A storage area network (SAN) is a means to supply I/O in blocks, as in DAS — but in a controlled, network arrangement that permits the nondisruptive addition and retirement of storage, and also centralizes administration. These days, SANs are being widely implemented in the enterprise data center environment — primarily using the physical interface of fibre channel.

Multiple networks

There will probably be two networks involved in the enterprise data center environment: one for LANs, for uses such as email and Internet access, and another for the corporate data that is used to store and provide data to the servers on which business data processing is done. This physical separation of the corporate data provides the foundation for the security and performance controls that are necessary in handling data that is a valuable corporate asset.

Many storage solutions include virtualization of storage. The purpose: to enable policy-based automation as one of the main contributors in increasing the amount of storage one manager can administer. There are a variety of virtualization solutions being offered today. They are generally classified as storage networking, and promise to consolidate the management of storage.

Economics and storage decisions

Now that the challenge of managing storage growth is understood, the economics involved in making a decision about storage acquisition need to be examined. Many times, the technology or the newness of a particular product becomes a factor in making a decision. That is a natural temptation and is preyed on by sales and marketing strategies. This needs to be a business decision, with all the facts and the implications understood and





WHEN FAILURE IS NOT AN OPTION

You can rely on DLTtape™ technology for extraordinary data protection and a complete range of tape storage solutions – now and in the future. And with its progressive product roadmap, Super DLTtape™ technology is on target to deliver tape backup solutions with capacities greater than 1 terabyte and blistering transfer rates of more than 180 MB/sec. Of course, Super DLTtape products are backward-read compatible, so you won't have to leave your data behind. Find out more at www.superdlttape.com.

Figure 2:

TCO - Total Cost of Ownership

Typically looks at annual costs of systems/solutions. Elements of TCO include:

Product Costs - software and hardware
- **Implementation costs**
- **Training costs**

Administration (operational) costs
- **Support - monitoring and tuning**
- **Maintenance (including power, space, etc.)**
- **Upgrade**

Data unavailability cost
- **Direct - additional support**
- **Indirect - lost business**

clearly factored into the process.

Even during adverse economic cycles, decisions about deploying storage may have economic potential. It is relatively easy to say that all that needs to be done is to look at the ROI, then make a decision to go forward with a purchase or project. But since storage is critical to business and represents a large part of IT hardware expenditures, examining the economics of the storage strategy is critical. This is so important to the long-term ability to provide the storage and retrieval of critical data needed for business operation that it should be a standard business practice.

Understanding TCO, ROI

The mechanism frequently used for measuring the economics of storage is the TCO model. That model typically uses an annualized cost factor for storage, which includes the elements of product costs, administration costs, for data unavailability and other factors. The maintenance costs usually include power and space requirements. Figure 2 contains some of the major components of TCO.

ROI is a calculation that shows payback for the investment made. It is used widely in IT for almost any type of project. Figure 3 gives an overview of ROI.

In calculating both ROI and TCO, there are hard benefits and soft benefits, sometimes referred to as hard dollars and soft dollars. Hard benefits are usually considered to be:

- Capital savings or deferred capital investment
- Operational savings
- Improvements in staff productivity

The implication by calling them hard benefits is that these are measurable savings that will be independent of other factors. Typically segregated as soft benefits are:

- Opportunity costs
- Cost avoidance

They are considered soft benefits because calculations may be somewhat subjective and may be greatly influenced by other factors such as alternatives that may have to be taken. Unfortunately, while opportunity costs and cost avoidance are very real items and can be significant amounts of money (and have long-term business implications), they are viewed skeptically, especially if there have been some "creative" justifications in the past.

Most of the deployments of SANs to this point have been justified based on storage consolidation and backup of critical data. These were hard benefit calculations with very short pay

Figure 3:

ROI - Return On Investment

- **Calculated on a per-project basis**
- **Assessment of ROI for savings or gains from project implementation**
- **For storage decision, this will include:**
  - **Cost of solution (hardware and software plus implementation costs)**
  - **Savings in administration/operations**
  - **Gains in increased business, productivity, customer service, etc.**
- **Usually expressed as a % of gain with a payback period of time**



clearly factored into the process

Even during adverse economic cycles, decisions about deploying storage may have economic potential. It is relatively easy to say that all that needs to be done is to look at the ROI, then make a decision to go forward with a purchase or project. But since storage is critical to business and represents a large part of IT hardware expenditures, examining the economics of the storage strategy is critical. This is so important to the long term ability to provide the storage and retrieval of critical data needed for business operation that it should be a standard business practice.

Understanding TCO, ROI

The mechanism frequently used for measuring the economics of storage is the TCO model. That model typically uses an annualized cost factor for storage, which includes the elements of product costs, administration, costs for data unavailability, and other factors. The maintenance costs usually include power and space requirements. Figure 2 contains some of the major components of TCO.

ROI is a calculation that shows payback for the investment made. It is used widely in IT for almost any type of project. Figure 3 gives an overview of ROI.

In calculating both ROI and TCO, there are hard benefits and soft benefits, sometimes referred to as hard dollars and soft dollars. Hard benefits are usually considered to be

- Capital savings or deferred capital investment
- Operational savings
- Improvements in staff productivity

The implication by calling them hard benefits is that these are measurable savings that will be independent of other factors. Typically segregated as soft benefits are

- Opportunity costs
- Cost avoidance

They are considered soft benefits because calculations may be somewhat subjective and may be greatly influenced by other factors, such as alternatives that may have to be taken. Unfortunately, while opportunity costs and cost avoidance are very real items and can be significant amounts of money (and have long-term business implications), they are viewed skeptically, especially if there have been some "creative" justifications in the past.

Most of the deployments of SANs to this point have been justified based on storage consolidation and backup of critical data. These were hard benefit calculations with very short pay-



FAILURE IS NOT AN OPTION.

LOOK FOR THE DLTtape LOGO.

For more than a decade, DLTtape™ technology has been known for its unparalleled reliability in data protection and retrieval. That's why you should always look for the DLTtape logo when buying DLTtape products. This ensures that your company's mission-critical data is trusted to a quality media that has met the highest standards for reliability, compatibility and performance. In fact, DLTtape cartridges must pass a rigorous process to become fully qualified and display the DLTtape logo. This guarantees you're getting the de facto standard for data backup and retrieval. Products that do not have the DLTtape logo have not met these rigorous qualification standards.



So, be sure to use cartridges that carry the DLTtape logo. It gives you the confidence in knowing you've purchased the ultra-reliable backup solution that's chosen 5:1 by IS/IT managers. To find out how the DLTtape logo has become the ultimate symbol of quality and reliability, go to www.dlttape.com/qualified.

©2001 Quantum Corporation. All rights reserved. DLTtape and the DLTtape logo are trademarks of Quantum Corporation.

backs — typically less than 12 months. A 12 month payback is a good decision even in bad economic times. The deployments of NAS solutions have also primarily been based on consolidation of multiple file servers to a single NAS appliance. The justification or ROI there has also been a straightforward calculation of hard benefits. However, these have been the easy solutions.

The largest economic benefit to a company occurs when a storage strategy is implemented that addresses long term business issues. This involves both hard and soft benefits, and requires that the storage strategy be understood before looking at the ROI or TCO.

TCO may be a more useful tool here than ROI because of the longer term associated with implementing a complete strategy. The solutions that have been mentioned earlier — implementing a storage network with virtualization of storage and a comprehensive, integrated set of storage management tools to increase administrators' productivity — definitely require a TCO model that includes many business elements.

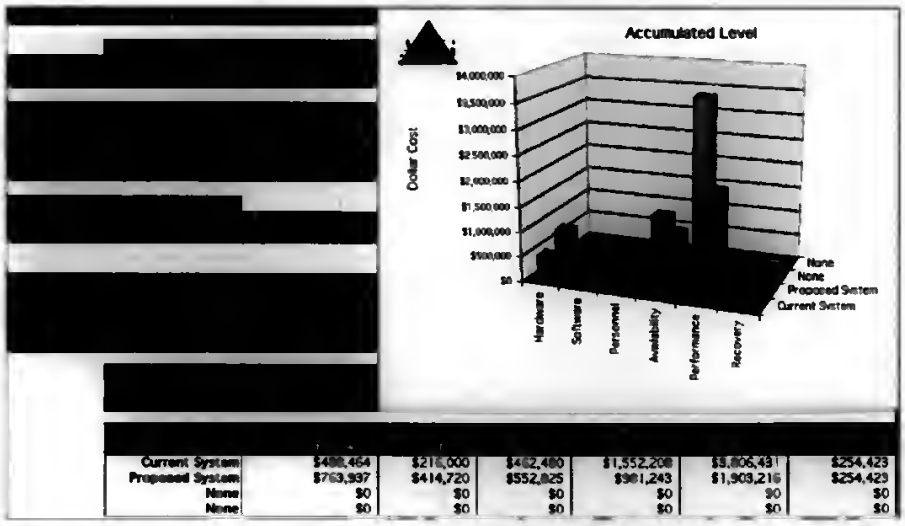
TCO is sometimes viewed as having a technology section and a business section in which to group individual elements. The technology section of TCO would include hardware, software, and associated personnel costs. These personnel costs include operations, support, consulting expenses, etc.

The business section of TCO includes availability, performance, and recovery. Availability reflects the cost to users of an impacting outage. Performance represents a productivity issue in that poor response time impacts users' productivity. The impact varies based on the individual application and number of users affected. Recovery is the time (and money) it takes to get the operation back to normal status. The time required for recovery represents an impact in productivity, potential lost business, and successive impacts that may be created.

The example in Figure 4 is a TCO

Figure 4:

TCO Calculation by AMG Inc.



Current System	$488,464	$216,000	$462,480	$1,552,208	$8,806,431	$254,423
Proposed System	$763,937	$414,720	$552,825	$981,243	$1,903,216	$254,423
None	$0	$0	$0	$0	$0	$0
None	$0	$0	$0	$0	$0	$0

If You're Building A SAN, Why Not Consider Using The Same Solutions
Thot Are At The Heort Of 96% Of The World's Storoge Networks?



Core to Edg
Ent rprise Solution

McDATA

evaluation done by AMG Inc., which shows an analysis of both the technology section (Hardware, Software, and Support) and the business section (Availability, Performance, and Recovery). In the example, the technology section shows a net increase in cost for the proposed system over the current system. The business section shows significant reductions in costs and therefore significant value. The overall economic value is a gain of about $2 million per year, according to this TCO calculation. Proceeding with the new system is the recommended business decision.

The technology section in the calculation is the direct calculation based on vendor offerings for the proposed systems and the changes in the administration of storage. Of greater interest for this example are the calculations behind the business section. To illustrate this, another example from AMG explains the derivation of the value in availability, performance, and recovery.

For this example, a company that accesses databases to conduct business is used. We assume an average salary plus benefits of $50,000 for employees processing data, and that there are 1,000 employees doing this activity. Looking at the expected business potential with all employees busy during normal work hours, the chart in Figure 5 breaks down the resource dollars that the company is expending.

Availability

When determining the value of availability improvement with the proposed solution, the calculation is based on spending the money in technology to improve availability by a specific amount of time.

In the AMG example, it is assumed that the technology will improve availability for productive time by 7.5 hours per year. This is the difference between 99.9% availability and 99.99% availability. The business benefit of the added availability includes the resource costs of the employees and the direct revenue generated during that time that would have been lost otherwise. In the example cited in Figure 4, the revenue generated over 7.5 hours is $800,000 and the resource expenditure is $180,000, which represents the business economics of availability for this particular solution.

Performance

The calculation of a performance improvement is not a one time gain, but an ongoing improvement throughout the year. Figure 5 shows a range of the difference a performance improvement makes based on the time lost without the improvement and the associated dollars lost in productivity.

The actual value used in the example represented in Figure 4 is a more precise number based on a particular business, but the chart in Figure 5 is fairly representative of the calculation done. For this example, assume the same salary and people in the earlier example. The time lost calculation is based on time lost in conducting a transaction when the response is at a certain value.

The type of user profile will determine the real impact on performance. Certain types of interactive work are more financially significant than oth

Figure 5: Example: Performance Value Calculation

60	1.67	$416,667	3.3	
120	3.3	$833,333	6.67	$1,666,667
240	6.67	$1,666,667	13.3	[illegible]


No amount
of profanity
will bring your
data back.
NETWORK STORAGE YOU CAN USE
Maxtor
VERITAS
otg
LEGATO
Windows
Powered

ers and must be quantified based on the value of productivity. This must be done on a case by case basis.

The last of the business elements is recovery of the business application to production status after a failure. The mechanics of performing the recovery are not being examined — only the business impacts of the amount of time it takes. In Figure 4, it was calculated that the recovery costs would be $254,423 based on the business lost, productivity affected, and several miscellaneous recovery costs.

These specific examples are representative of TCO calculations. There is more research and analysis required to develop the analysis that is beyond the scope of this white paper.

Conclusion

Storage decisions have been elevated to a very visible level due to the business implications of storage and the significant amount of money involved. The demand for storage continues to rise, and the ability to store and retrieve data efficiently can be a competitive advantage. It has become important to have an enterprise storage strategy that encompasses not just technology, but business decisions.

A storage strategy needs to be a standard business practice, which includes the methodology for making decisions. Decisions about acquisition, technology integration, and infrastructures are all part of that strategy. The evaluation part of making a decision has to have sound financial reasoning. Two methods are typically used: Return On Investment, which is used for projects and short term payback analysis, and Total Cost of Ownership, which typically covers a broader and longer term analysis of a solution.

Because of their business implications, storage decisions have been elevated to a more visible level. The ability to store and retrieve data efficiently can be a true competitive advantage. Thus, it's more critical than ever to formulate an enterprise storage strategy.

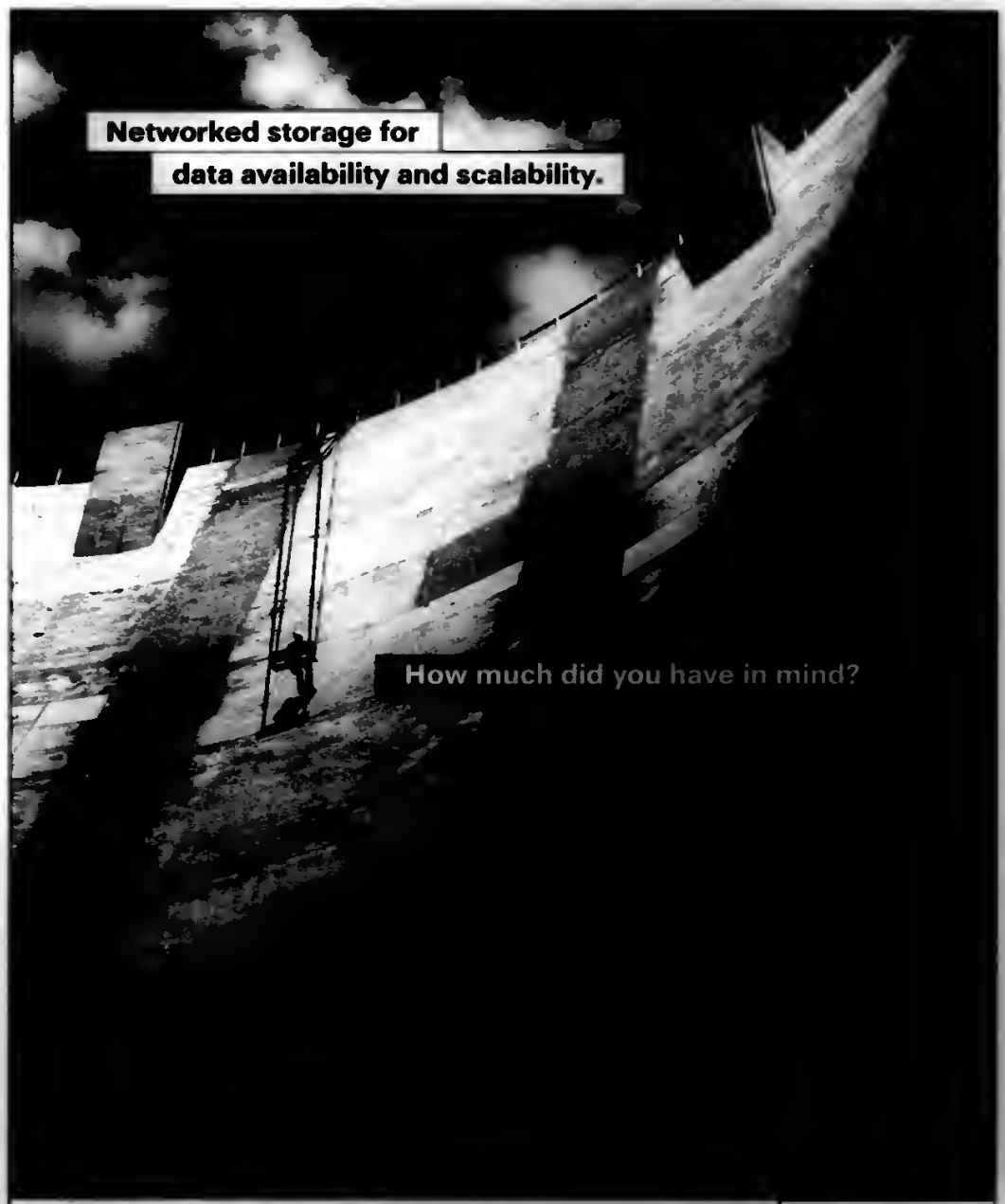
Using an ROI calculation for justification makes sense in showing payback for individual projects or products. In difficult economic times like these, when companies are being very conservative with expenditures, an ROI calculation can convincingly show the savings to be generated with a decision on storage that should convince even the most fiscally constrained finance officer.

A TCO calculation for storage should be done in the context of a solution (which includes more than just an individual hardware or software product) and should be a part of the long term storage strategy. The storage strategy is the type of information that would be presented to executives in an operational review. The TCO calculation becomes part of the effectiveness evaluation. It can demonstrate the organizational effectiveness and accomplishments. This combination of storage strategy and TCO calculations also highlight the importance of storing and retrieving of data to the corporation.

Hopefully, this discussion of the economics of a storage strategy will serve as guidance for enterprises that need to establish storage business practices in their IT organization. In addition, it may help overcome the cyclical emotions that impact bad economic times, and the "shiny toy" sales approach favored by some vendors in favor of sound business decisions with a repeatable, adhered to process. Regardless of our enthusiasm for the subject, this is a business issue. If an acquisition makes business sense, there should be no hesitation to proceed. ✣

Randy Kerns is a partner at Evaluator Group Inc. He is responsible for Storage Area Network and Network Attached Storage analysis and education, and also tracks company and product strategies in this area.

Kerns has over 28 years' experience in the development of storage products. He has worked for IBM, Fujitsu, Tandem Computers and Storage Technology Corp. He is a frequent author and speaker on storage topics.



If what you have in mind is unlimited scalability with continuous access to data, then Brocade has your solution. It's called a Storage Area Network (SAN). The enormous growth of business information along with the need for anytime, anywhere data access requires a new approach to data storage. A *networked approach*. A Brocade-based SAN enables your company to seamlessly add storage on demand to meet your ever growing data storage needs. Brocade SAN infrastructure solutions are available from leading system OEMs and integrators worldwide.

Improve your ROI, availability with SAN. Storage Area Network.
Find out now in our new white paper by visiting www.brocade.com/sa

BROCADE

©2001 by Brocade Communications Systems, Inc. All Rights Reserved



©2001 EDS. EDS is a registered mark and EDS & Design and EDS Solved & Design are trademarks of Electronic Data Systems Corporation.

Stretching the limits of your data storage systems?

EDS solved.
eds.com

EMC² PROVEN

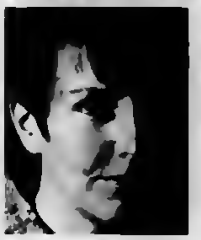
EDS Intelligent Storage Services, with the burstable capacity of Liquid Storage℠, can tame your most volatile e-business flows with confidence, without bursting limited capital budgets. Intelligent Storage Services, offered by EDS and other service providers digitally powered by EDS, gives you the storage capacity you need, when you need it. Call us at 888-889-1392, or visit us online at eds.com/storage, before your current system leaves you all wet.

THIS WEEK

NETWORK DEFENSE

If you've been asked to set up a network in Russia, China or the Middle East, be aware of the "gotchas" — like hactivism, internal espionage and embezzlement — that could stymie your effort. PAGE 32

ISLAMIC STRUGGLES



Despite a backlash against some Muslim Americans since the Sept. 11 attacks on the U.S., many Muslim IT workers say they are coping fairly well and that their co-workers have rallied around them to show support and respect, writes Kathleen Melymuka. PAGE 34

BOOK REVIEWS

Six new management tomes offer ideas about how to leverage your competitors' strengths and become more customercentric and forward-thinking. PAGE 38

AGGREGATION SHIFTS

Most banks that offer online aggregation services are using a hosted model. But a growing number are expected to look into managing these services and supporting technologies in-house. PAGE 40

GENE GENIES

Helping to map the human genome is the ultimate coding challenge for IT workers at Celera Genomics, not to mention the chance to work at one of the largest civilian supercomputer centers in the world. PAGE 45

JOE AUER/DRIVING THE DEAL

A Ploy That Didn't Fly

HERE'S A NEW TWIST on the old "sense of urgency" ploy that a vendor used in a recently completed deal. The procurement manager of a global consumer goods company was talking to a potential vendor about a deal for some technology services. He had a short list of prospective vendors, but because of unique requirements imposed by his company's biggest customer, he was talking with the only prospective vendor that could provide the services. But it appeared that the vendor didn't know that it was the sole contender in this deal, so the company maintained a strong negotiating stance.

As the two sides discussed plans for negotiating sessions, the vendor announced that the customer must sign the vendor's letter of intent to enter a contract before the two sides could negotiate. The vendor's representative claimed that he couldn't reserve the corporate jet for his negotiating team to come to the customer's location if there was no letter of intent. Clever. But wait — it gets worse. The letter of intent had some ugly "gotchas," such as:

- The customer had to complete its legal review of the contract by a certain date.
- Both parties were to meet on that date to sign the contract.

The date specified in the letter of intent was the same date that negotiations were scheduled to start, so the vendor was effectively preempting any meaningful negotiations. Basically, the vendor's negotiating stance was that it couldn't reserve the corporate jet to visit if there was no letter of intent, so it wouldn't negotiate until the customer gave away its negotiating power.

Let's look at the customer's side. There are good reasons for never signing a letter of intent. First, the intent can be construed as part of a contract, especially if there's evidence of other contract components between the parties. Ask your lawyer about *offer and acceptance, reliance* and *consideration*. If activities have taken place in the relationship that could constitute the occurrence of these legal theories of contract law, and they are combined with *intent* (another legal theory of what constitutes a contract) in the letter, you could, in effect, have a contract.

Given this set of circumstances, the customer could be guilty of breach of contract if it backed out of a letter of intent. Even without all the components of a contract at hand, most customers feel that reneging on a letter of intent would be less than good-faith dealings or convey a lack of integrity.

Of course, a letter of intent also immediately removes your leverage with the vendor because it eliminates competition. It locks you in before you negotiate, and that's called begging, not negotiating.

But in this deal, is the big issue the letter of intent? Or is it the lack of vendor transportation? Neither. It was about the vendor producing a sense of urgency and eliminating customer options to gain control of the terms and conditions of the relationship.

Luckily, the corporate-jet ploy didn't fly with this customer.

Having faith in his negotiation process and knowing that competition — real or imagined — was a very effective bargaining tool, the customer issued a simple response to the vendor. "We don't do letters of intent, so don't bother to come. We will be happy to negotiate via conference call. However, your competition will be here in person."

Remember that the vendor's representative probably didn't know for sure if he was the sole source in the deal. He may have suspected he was and used the corporate-jet ploy as a way to test his suspicion. The customer's terse response probably created uncertainty in the vendor's mind and could have eliminated any overconfidence. Shortly thereafter, the vendor's representative announced that he was able to get the corporate jet after all and would be available to negotiate on the date the customer specified.

This vendor ploy was designed to stampede the customer into signing a contract that was highly favorable to the vendor. The customer's firm response was a very effective tactic. Best of all, the customer was able to gain the high ground during negotiations, saving money and gaining significant contractual protection. ▸



Joe Auer is president of International Computer Negotiations Inc. (www.dobetterdeals.com), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High Tech Acquisition Professionals. Contact him at joe@dobetterdeals.com.

THE TOP Techno-MBA PROGRAMS

MBA degree programs that focus on IT come in as many varieties as the colleges and universities that offer them. But there are some common traits that set off the best from the rest.

By Lee Copeland

COMPUTERWORLD'S 4th Annual TECHNO-MBA SURVEY

With a few promotions and a lot of technical expertise, 37-year-old Peter Webb gained exposure to new areas of The MathWorks Inc.'s scientific computing business.

But Webb, a principal technical specialist at the Natick, Mass.-based company, also found that his bachelor's and master's degrees in computer science didn't provide enough insights into other parts of the corporate big picture, such as marketing and finance, to take him where he wanted to go.

"My role had expanded to the point where I was at a disadvantage, and my technology background was not sufficient to perform at the level that I would like to perform," says Webb. "I would get into discussions with the marketing people, and they speak in this cryptic jargon that I couldn't understand."

To rectify that situation, Webb enrolled last year in the High Technology MBA program at Boston-based Northeastern University. He expects to be fluent in the jargon and concepts of business management by next spring.

But contrast his approach to that of many IT professionals just two years ago, when students were abandoning MBA programs in droves during the innovation-driven dot-com bubble. The big debate for many then was whether a technologist with smarts should try to break his way into the executive suite through the force of sheer intelligence and bravado, or take a two-year hiatus and pursue an MBA.

That debate ended abruptly when the bubble burst. With the demise of the dot-com era, MBA programs, particularly those that offer a strong concentration in technology, are more popular than ever.

The question now becomes: Which schools do the best job of combining good management techniques and technology innovation under the general heading of sound business practices?

There are as many types of techno-

MBA programs as there are three-letter acronyms in the technology industry.

Each school takes a slightly different approach, but the overriding theme is of shifting the focus away from technology products and systems and placing the emphasis squarely on the business's bottom line.

"Folks with an MBA from a top business school weren't affected by the dot-com hiccup; they knew how to do a business plan," claims Richard Honack, assistant dean of external relations at Northwestern University's Kellogg School of Management. "You have to teach that technology is a tool, and not the end-all."

Business Fundamentals

Some programs, such as the one at Evanston, Ill.-based Kellogg, which is routinely ranked as a top business school, take a finance, accounting and operations-oriented approach to training business managers. Kellogg's two-year program offers a major in technology and e-commerce, requires a summer internship and includes courses that delve into Internet business models, research-and-development management, business intelligence and customer relationship management technologies.

But those technology classes follow two quarters' worth of pure business coursework. The Kellogg program starts with a core curriculum that includes a bevy of decision-making and analysis, statistics, finance, microeconomics and operations classes.

"If technology goes down, you still have to operate your business. It's always hard to get past the bells and whistles, but does everybody have to have them?" asks Honack, who adds that Kellogg trains executives, not technicians. "They learn the general management of technology and how it weaves its way throughout a company."

Northeastern's High Technology MBA program eschews the traditional full-time student experience. Its students are full-time professionals who must obtain the support of their employers to enroll.

"The program is designed for people engaged in, immersed in and managing in the high-tech industry. So the students must have support from their companies to be in the program," says Ira Weiss, dean of the college of business administration at Northeastern. "We are a co-op program and leverage real-world experiences back into the classroom."

As a result, students at Northeastern's techno-MBA program are typically about 31 years old. Students at traditional programs, such as Kellogg, are usually between the ages of 27 and 28 and have less work experience.

Living on a student's budget for two years isn't an option for everyone, so Northeastern designed its program around the needs of working professionals.

Webb, for example, has worked at MathWorks for the past seven years and holds both a bachelor's degree and a master's degree in computer science. He wanted to shore up his business acumen by earning an MBA, but with a wife, a child and a mortgage, giving up his salary while taking two years off to attend graduate school wasn't feasible.

As a second-year student at Northeastern, Webb maintains a full-time work schedule at MathWorks while taking graduate courses on alternating Tuesday nights and Saturday mornings. MathWorks pays $5,000 of the $26,000 annual tuition.

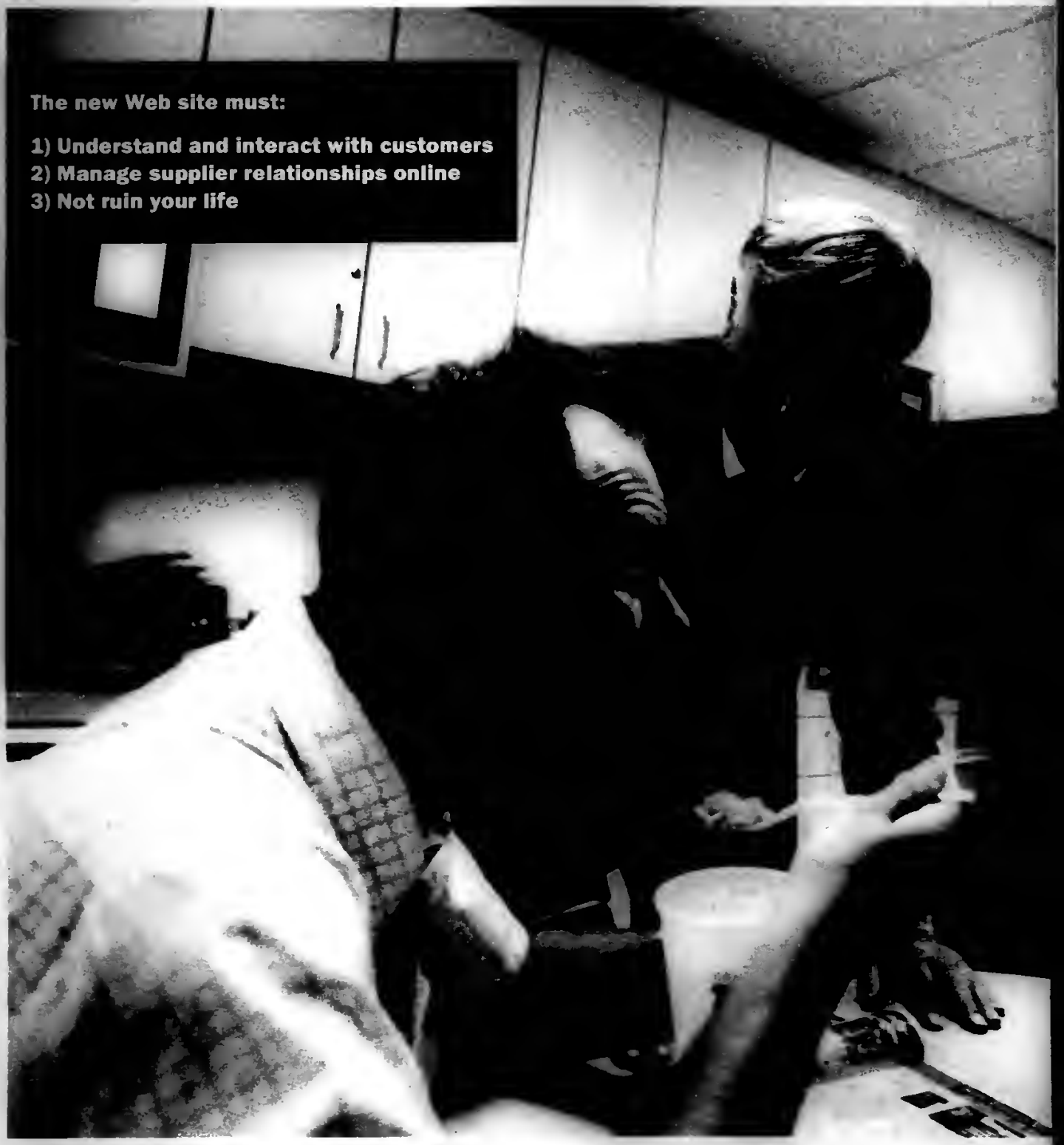
Webb says that while he has no plans to look for a higher-paying job elsewhere after completing the program in May, he believes the coursework is already paying off.

"No matter what discipline you're in as part of [an MBA program], you learn to speak the language of business," Webb says. "I had already mastered the technical part. Now with the MBA skills, I can take what I know and apply it to the market and figure out how to get technology ideas out of the lab and onto the street."

But technology-driven MBA pro-

Continued on page 30

> We want the students to get a solid grounding in all aspects of management and the tools to drive strategic thoughts to manage a business.
>
> CHUCK JOHNSON (ABOVE), DIRECTOR, PROFESSIONAL MASTER'S PROGRAM, PURDUE UNIVERSITY



*Microsoft 2000—includes Web sites running on previous versions of Microsoft Windows and Microsoft Commerce Server. © 2001 Microsoft Corporation. All rights reserved. Microsoft and BizTalk are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. The names of actual



MICROSOFT® COMMERCE SERVER 2000 Upper management is asking for the moon, quickly and cost-efficiently develop a site that offers a personalized experience for customers and partners. In the past, building-in the kind of robust data analytics you're being asked for could take thousands of hours (most of them yours). But now there's help: Microsoft Commerce Server 2000.

Part of the flexible Microsoft .NET Enterprise Server family, Commerce Server 2000 works with BizTalk™ Server 2000 and SQL Server™ 2000 to offer you a less complicated and less time-consuming approach to building tailored, effective e-commerce solutions. For example, Commerce Server 2000 comes with fully functional out-of-the-box starter sites, and pre-built applications such as click stream analysis, to help you get your site up and running even faster. And with full XML support, seamless data transfer moves from the wish list to the "done" list.

MARKET FACT

According to Netcraft, the leading supplier of market intelligence and Web server data, more e-commerce Web site solutions are built on the Microsoft enterprise e-commerce platform than on any other.*

So go ahead and build the effective site you're being asked to build, and still manage to have a life. To find out more, visit microsoft.com/commerceserver. Software for the Agile Business.

Microsoft

companies and products mentioned herein may be the trademarks of their respective owners.

THE TOP Techno-MBA PROGRAMS

[listed below in alphabetical order]

COMPUTERWORLD'S 4th Annual TECHNO-MBA SURVEY

Continued from page 27

grams aren't just for technologists looking to move into management. Many students hope to jump-start an IT career by entering corporate ranks from the management level.

Take Eric Dulin, for example. A consultant with IBM's $33 billion Global Services division, Dulin, 33, graduated from Purdue University's Krannert School of Management last May.

He is a former captain in the U.S. Army who holds a bachelor's degree in management from Louisiana State University in Baton Rouge, and he wanted to go into IT consulting when he retired from the military in August 1999. Dulin says he felt that career choice would utilize the operations skills he acquired during his six years in the Army.

"It was a fresh start for me," Dulin says. "Krannert gave me the opportunity to be in a technology-focused program and the opportunity to take MIS classes to supplement what I was learning. [The program] reflects reality, because work in technology is aimed at improving the business as a whole."

One of Krannert's goals is to ensure that techno-MBA students don't just jump into the deep end of business without a technology-infused lifeline, says Chuck Johnson, director of the professional master's program at West Lafayette, Ind.-based Purdue.

"Many of our folks want to learn new things and apply new skills. But at the same time, our folks don't want to break away completely from the technology," Johnson says. "Instead, they're asking, 'How do I leverage technology in the next level of my career?' "

Krannert sponsors a technology transfer initiative that pairs its techno-MBA students with doctoral students in technology, science and engineering. The initiative helps business students evaluate the commercial viability and marketability of new technologies, Johnson says.

Accordingly, most MBA programs

	Location	Website	Name	Average GMAT*	Ratio of IT students to faculty members
Arizona State University	Tempe, Ariz.	www.mis.asu.edu/cmt	College of Business	636	1:6
Georgia Institute of Technology	Atlanta	www.dupree.gatech.edu	Dupree College of Management	636	1:7
Indiana University	Bloomington, Ind.	www.kse.indiana.edu	Kelley School of Business	660	1:30
Northeastern University	Boston	www.cba.neu.edu	Graduate School of Business Administration	630	1:4
Purdue University	West Lafayette, Ind.	www.mgmt.purdue.edu	Krannert School of Management	641	1:8
University of Arizona	Tucson, Ariz.	www.eller.arizona.edu/mba	Eller College of Business and Public Administration	652	1:22
University of California, Irvine	Irvine, Calif.	www.gsm.uci.edu	Graduate School of Management	660	1:6
University of Georgia	Athens, Ga.	www.terry.uga.edu	Terry College of Business	641	1:8
University of Maryland	College Park, Md.	www.rhsmith.umd.edu	Robert H. Smith School of Business	665	1:5
University of Minnesota, Twin Cities	Minneapolis	http://carlsonmba.umn.edu/	Carlson School of Management	640	1:4
University of Pennsylvania	Philadelphia	www.wharton.upenn.edu	Wharton School of Business	700**	1:12
University of Rochester	Rochester, N.Y.	www.simon.rochester.edu	William E. Simon Graduate School of Business	660	1:12
University of Washington	Seattle	www.mba.washington.edu	University of Washington Business School	662	1:8

Methodology: As is the traditional process for this project, Computerworld conducted its fourth annual Techno-MBA Survey in two parts. In April through June, we asked campus recruiters nationwide to nominate the best techno-MBA programs, based on their experience hiring graduates from those programs. We also asked college and university MBA programs to nominate the best techno-MBA programs nationally, other than their own programs, based on the quality of the curricula in those programs. The results of these surveys produced our top candidates for the techno-MBA survey. As the second part of the project, this summer Computerworld

that offer a technology coocentration, major or track don't cover the same ground as graduate programs that focus on technology. Instead, these programs stress achieving business goals that involve technology, so the emphasis is on analytical skills, business operations and financial imperatives.

"We focus on not the tecbnical skills, but on the strategic savvy to use technology in a way that provides an advantage to the organization," says Robert S. Sullivan, dean of the Kenan-Flagler Business School at the University of North Carolina (UNC) at Chapel Hill.

At UNC's program, 35% of students enter the program with an engineering or technical degree, Sullivan says.

Michael Holmes, 30, is one such student. Witb a bachelor's degree in mechanical engineering from the University of Rochester in New York, Holmes says he was putting his technical, problem-solving and analytical skills to work as a sales engineer earning $150,000 per year. He says he decided to enter Kenan-Flagler last year to polish those skills and gain more exposure to core business and finance concepts.

Obtaining hands-on real-world experience during the course of the graduate program is another important component of most MBA programs.

Real-World Problems

Many schools work with companies to give their students access to new technologies and new business problems that could he solved with technology.

The University of Illinois at Urbana-Champaign, for example, offers an applied business seminar that requires students to create business plans and real-world projects.

Purdue's Krannert incorporates hands-on experience by inviting companies to work with students on real projects and by partnering with technology vendors such as SAP AG and Hewlett-Packard Co. The partnership helps students gain additional insights about key applications and technologies that they might have to manage later in their careers.

"We want the students to get a solid grounding in all aspects of management and the tools to drive strategic thoughts to manage a business," says Johnson. "They get the opportunity to get their hands dirty and apply their technical knowledge with newfound strategic knowledge."

For example, New York-based Philip Morris Cos. focused a project on competitive market analysis and an analysis of whether developing an online consumer goods marketplace made good business sense, Dunlin says. The students and Philip Morris staffers concluded that the combination of high logistics costs and low profit margins on commodity goods would make it difficult to turn a profit on the online venture.

"There's no room in an MBA program for assuming something works and that everyone loves it," Dulin says.

That ability to distinguish between what's technologically possible and what's feasible in terms of the marketability, financing and profitability of technology-driven business initiatives is at the heart of all the curriculums in all of *Computerworld*'s Top 25 MBA programs. ▶

> We focus on not the technical skills, but on the strategic savvy to use technology in a way that provides an advantage to the organization.
>
> ROBERT S. SULLIVAN, DEAN, KENAN-FLAGLER BUSINESS SCHOOL, UNIVERSITY OF NORTH CAROLINA

Graduate IT classes with fewer than 25 students	[illegible] IT internships	[illegible] IT problem solving	[illegible] Ph.D. / DBA	Number [illegible] IT grads graduating, 2001	[illegible] with six-month IT	Average [illegible] IT graduate	[illegible]	[illegible]
89%	84%	70%	89%	101	88%	$78,057	$7,344	$16,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14%	100%	100%	100%	27	100%	$82,000	$4,902	$17,202
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30%	85%	100%	100%	50	88%	$105,000	$8,000	$18,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0%	100%	100%	100%	28	100%	$80,000	$25,574	$25,574
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60%	97%	63%	100%	26	100%	$83,010	$8,672	$17,982
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
82%	58%	100%	85%	22	100%	$67,510	$8,348	$17,004
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60%	82.5%	58%	100%	156	100%	$81,408	$11,400	$21,749
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0%	NT	75%	100%	46	88%	$72,000	$3,770	$12,794
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60%	78%	72%	100%	30	100%	$85,000*	$11,830	$16,183
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
57%	88%	80%	93.3%	24	88%	$72,000	$14,515	$16,320
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80%	100%	0%	100%	28	100%	$100,000	$32,818	$32,818
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22%	0%	80%	88%	85	100%	$78,057	$26,400	$26,400
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100%	100%	50%	57%	28	100%	$71,000	$5,000	$14,500

asked the colleges and universities to provide detailed information about their techno-MBA degree programs. In addition to the 25 programs listed above, the following schools were nominated as among the best, but failed to provide information about their programs: Carnegie Mellon University, MIT, Harvard University, Duke University, Stanford University and New York University.

Notes: NA = Not available; NT = Not tracked; * Includes bonus; ** Total class; † Includes consultant salaries

THE TOP Techno-MBA PROGRAMS

COMPUTERWORLD'S 4th Annual TECHNO-MBA SURVEY

Continued from page 27

grams aren't just for technologists looking to move into management. Many students hope to jump-start an IT career by entering corporate ranks from the management level.

Take Eric Dulin, for example. A consultant with IBM's $33 billion Global Services division, Dulin, 33, graduated from Purdue University's Krannert School of Management last May.

He is a former captain in the U.S. Army who holds a bachelor's degree in management from Louisiana State University in Baton Rouge, and he wanted to go into IT consulting when he retired from the military in August 1999. Dulin says he felt that career choice would utilize the operations skills he acquired during his six years in the Army.

"It was a fresh start for me," Dulin says. "Krannert gave me the opportunity to be in a technology-focused program and the opportunity to take MIS classes to supplement what I was learning. [The program] reflects reality, because work in technology is aimed at improving the business as a whole."

One of Krannert's goals is to ensure that techno-MBA students don't just jump into the deep end of business without a technology-infused lifeline, says Chuck Johnson, director of the professional master's program at West Lafayette, Ind.-based Purdue.

"Many of our folks want to learn new things and apply new skills. But at the same time, our folks don't want to break away completely from the technology," Johnson says. "Instead, they're asking, 'How do I leverage technology in the next level of my career?'"

Krannert sponsors a technology transfer initiative that pairs its techno-MBA students with doctoral students in technology, science and engineering. The initiative helps business students evaluate the commercial viability and marketability of new technologies, Johnson says.

Accordingly, most MBA programs

College/University	Location	Web site	Name of program	IT students Average GMAT score	Ratio of IT faculty to students
Arizona State University	Tempe, Ariz.	www.cob.asu.edu/acct	College of Business	636	1:6
Bentley College	Waltham, Mass.	www.bentley.edu/graduate	McCallum Graduate School of Business	570	1:8
Georgia Institute of Technology	Atlanta	www.dupree.gatech.edu	Dupree College of Management	635	1:7
Georgia State University	Atlanta	www.robinson.gsu.edu	Robinson College of Business	600	1:7
Indiana University	Bloomington, Ind.	www.bus.indiana.edu	Kelley School of Business	660	1:30
Michigan State University	East Lansing, Mich.	mba.bus.msu.edu	The Eli Broad Graduate School of Management	627	1:9
Northeastern University	Boston	www.cba.neu.edu	Graduate School of Business Administration	626	1:4
Northwestern University	Evanston, Ill.	www.kellogg.nwu.edu	Kellogg Graduate School of Management	700	1:7
Purdue University	West Lafayette, Ind.	www.mgmt.purdue.edu	Krannert School of Management	641	1:3
Rensselaer Polytechnic Institute	Troy, N.Y.	http://lallyschool.rpi.edu	Lally School of Management and Technology	622	1:4
University of Arizona	Tuscon, Ariz.	www.eller.arizona.edu/mba	Eller College of Business and Public Administration	652	1:23
University of California, Berkeley	Berkeley, Calif.	www.haas.berkeley.edu	Haas School of Business	690	1:14
University of California, Irvine	Irvine, Calif.	www.gsm.uci.edu	Graduate School of Management	669	1:6
University of California, Los Angeles	Los Angeles	www.anderson.ucla.edu	The Anderson School at UCLA	700	1:10
University of Georgia	Athens, Ga.	www.terry.uga.edu	Terry College of Business	641	1:3
University of Illinois at Urbana-Champaign	Urbana, Ill.	www.mba.uiuc.edu	College of Commerce & Business Administration – MBA Program	621	1:9
University of Maryland	College Park, Md.	www.rhsmith.umd.edu	Robert H. Smith School of Business	655	1:5
University of Michigan	Ann Arbor, Mich.	www.umich.edu/~cisdept	University of Michigan School of Business	675**	1:4
University of Minnesota, Twin Cities	Minneapolis	http://carlsonmba.umn.edu/	Carlson School of Management	646	1:4
University of North Carolina	Chapel Hill, N.C.	www.kenan-flagler.unc.edu	Kenan-Flagler Business School	666**	1:8
University of Pennsylvania	Philadelphia	www.wharton.upenn.edu	Wharton School of Business	700**	1:12
University of Pittsburgh	Pittsburgh	www.katz.pitt.edu	Katz Graduate School of Business	622	1:4
University of Rochester	Rochester, N.Y.	www.simon.rochester.edu	William E. Simon Graduate School of Business	609	1:12
University of Texas at Austin	Austin, Texas	www.texasmba.bus.utexas.edu	McCombs School of Business	666	1:16
University of Washington	Seattle	www.mba.washington.edu	University of Washington Business School	652	1:8

Methodology: As is the traditional process for this project, *Computerworld* conducted its fourth annual Techno-MBA Survey in two parts. In April through June, we asked campus recruiters nationwide to nominate the best techno-MBA programs, based on their experience hiring graduates from those programs. We also asked college and university MBA programs to nominate the best techno-MBA programs nationally, other than their own programs, based on the quality of the curricula in those programs. The results of these surveys produced our top candidates for the techno-MBA survey. As the second part of the project, this summer *Computerworld*

that offer a technology concentration, major or track don't cover the same ground as graduate programs that focus on technology. Instead, these programs stress achieving business goals that involve technology, so the emphasis is on analytical skills, business operations and financial imperatives.

"We focus on not the technical skills, but on the strategic savvy to use technology in a way that provides an advantage to the organization," says Robert S. Sullivan, dean of the Kenan-Flagler Business School at the University of North Carolina (UNC) at Chapel Hill.

At UNC's program, 35% of students enter the program with an engineering or technical degree, Sullivan says.

Michael Holmes, 30, is one such student. With a bachelor's degree in mechanical engineering from the University of Rochester in New York, Holmes says he was putting his technical, problem-solving and analytical skills to work as a sales engineer earning $150,000 per year. He says he decided to enter Kenan-Flagler last year to polish those skills and gain more exposure to core business and finance concepts.

Obtaining hands-on real-world experience during the course of the graduate program is another important component of most MBA programs.

Real-World Problems

Many schools work with companies to give their students access to new technologies and new business problems that could be solved with technology.

The University of Illinois at Urbana-Champaign, for example, offers an applied business seminar that requires students to create business plans and real-world projects.

Purdue's Krannert incorporates hands-on experience by inviting companies to work with students on real projects and by partnering with technology vendors such as SAP AG and Hewlett-Packard Co. The partnership helps students gain additional insights about key applications and technologies that they might have to manage later in their careers.

"We want the students to get a solid grounding in all aspects of management and the tools to drive strategic thoughts to manage a business," says Johnson. "They get the opportunity to get their hands dirty and apply their technical knowledge with newfound strategic knowledge."

For example, New York-based Philip Morris Cos. focused a project on competitive market analysis and an analysis of whether developing an online consumer goods marketplace made good business sense, Dunlin says. The students and Philip Morris staffers concluded that the combination of high logistics costs and low profit margins on commodity goods would make it difficult to turn a profit on the online venture.

"There's no room in an MBA program for assuming something works and that everyone loves it," Dulin says.

That ability to distinguish between what's technologically possible and what's feasible in terms of the marketability, financing and profitability of technology-driven business initiatives is at the heart of all the curriculums in all of *Computerworld*'s Top 25 MBA programs. ◗

> We focus on not the technical skills, but on the strategic savvy to use technology in a way that provides an advantage to the organization.
>
> ROBERT S. SULLIVAN, DEAN, KENAN-FLAGLER BUSINESS SCHOOL, UNIVERSITY OF NORTH CAROLINA

Graduate IT classes with fewer than 25 students	Graduate classes with IT-related internships	Graduate classes requiring real-world IT problem solving	IT faculty with Ph.D. or DBA	Number of IT graduates in spring 2001	2000 IT graduates accepting employment within six months	Average salary of spring 2000 IT graduates	Average tuition for in-state students	Average tuition for out-of-state students
26%	84%	70%	86%	101	96%	$79,057	$7,344	$15,800
41%	60%	100%	91%	103	98%	$65,010	$23,000	$23,000
14%	100%	100%	100%	27	100%	$92,938	$4,902	$17,202
8%	10%	98%	96%	199	87%	$83,000	$4,000	$16,000
50%	95%	100%	100%	50	99%	$105,000	$9,000	$19,000
25%	100%	17%	100%	23	100%	$80,850	$12,800	$16,900
0%	100%	100%	100%	38	100%	$90,000	$25,574	$25,574
0%	100%	60%	20%	200	100%	$140,000	$28,677	$28,677
50%	97%	63%	100%	26	100%	$93,016	$6,672	$17,992
0%	NT	100%	100%	17	100%	$73,000	$22,317	$22,317
62%	56%	100%	95%	22	100%	$67,810	$9,348	$17,804
0%	70%	70%	100%	98	99.5%	$128,300	$10,458	$20,702
60%	82.5%	55%	100%	155	100%	$81,466	$11,499	$21,743
30%	75%	NT	100%	45	83.3%	$90,000	$11,744	$22,448
0%	NT	75%	100%	48	89%	$72,300	$3,776	$12,794
10%	60%	98%	100%	71	95%	$75,148	$12,410	$20,138
60%	70%	72%	100%	58	100%	$85,959*	$11,830	$16,193
0%	20%	60%	100%	80	100%	$140,000'	$23,686	$28,686
57%	98%	80%	93.3%	24	96%	$72,600	$14,515	$18,320
10%	23%	100%	100%	40	97%	$77,480	$14,760	$28,739
20%	100%	5%	100%	89	100%	$100,000	$32,618	$32,618
62%	100%	70%	100%	35	100%	$75,500	$20,812	$33,094
22%	5%	60%	96%	85	100%	$79,567	$26,460	$26,460
96%	95%	83%	92%	120	100%	$74,200	$8,525	$21,185
100%	100%	60%	87%	28	100%	$71,600	$5,859	$14,580

asked the colleges and universities to provide detailed information about their techno-MBA degree programs. In addition to the 25 programs listed above, the following schools were nominated as among the best, but failed to provide information about their programs: Carnegie Mellon University, MIT, Harvard University, Duke University, Stanford University and New York University.

Notes: NA = Not available; NT = Not tracked; * Includes bonus; ** Total class; ' Includes consultant salaries

Volatile Sta

Managing IT security in tightly controlled nations or turbulent regions can be vexing for IT leaders charged with orchestrating operations overseas. By Deborah Radcliff

IF YOU'VE GOT A NETWORK in Russia, you must register your encryption methods and programs with the government. All data and voice traffic in China goes through government-owned switching centers. Cyberactivism, internal espionage and embezzlement are rampant in South America. And in volatile areas like the Middle East, terrorism poses great physical risk to both networks and personnel.

If you're asked to set up a network overseas, would you even know where to start? If not, your company could lose valuable intellectual property, be fined or even be expelled for not following the rules, says Perry Luzwick, director of information assurance architectures at Northrop Grumman Corp.'s IT sector in Herndon, Va.

More than 35,000 branches of 2,600 U.S. firms operate overseas today, according to the 2001 edition of the Directory of American Firms Operating in Foreign Countries. And if the Fortune 500 client base of Exodus Communications Inc. in Santa Clara, Calif., is any indication, most businesses don't have staffers with the knowledge IT managers need to set up secure networks overseas, says Bill Hancock, senior vice president of security at Exodus.

For example, Hancock cites a client (a "very large bank") that asked Exodus to set up free exchange of information among its sites in Germany, London, New Jersey, Tokyo, Hong Kong and Sydney, Australia. The client's CIO had no idea about the rules governing data security and privacy in the countries involved.

Hancock's team started by asking the CIO what type of information the bank wanted to share. The CIO said it wanted international customer access to account information. When the Exodus team started checking the laws in those countries, "it became a very large snowball," Hancock says. For starters, under the U.K.'s Regulatory Investigative Powers Act, authorities conducting criminal investigations can compel an Internet service provider to turn over encryption keys, client data and any additional investigative support they request, Hancock explains. In Japan, private information must be stored in separate systems or files with strict access controls. And in China, encryption is strongly regulated, and all Internet and telephone traffic must pass through specific government connection points.

"You have to decide if you even want to park data in some of these locations," Hancock says, "because it may be intercepted and scanned by the government."

Who You Know

If your organization is moving into one of these regions, a good place to gather background information is among your peers at companies that have already set up networks there, says John Hartmann, vice president of security at Cardinal Health Inc., a $49 billion pharmaceutical and medical services company in Dublin, Ohio, with operations in 23 countries.

"If you're in pharmaceuticals, talk to someone who's doing the same business in Beijing," he says. "Or talk to someone in the tech industry who's losing their shirt in Japan."

It's likely that those companies can share not only their experiences but also references to international business consulting firms. One that Cardinal relies on is Control Risks Group, a London-based firm that provides geopolitical, investigative and crisis management services in more than 130 countries. For intelligence services specific to IT infrastructure, Cardinal uses a second company, Vigilinx Inc. in Parsippany, N.J., which is staffed by former military intelligence agents.

Hartmann, a former special agent with the FBI's foreign counterintelligence squad, knows firsthand the dangers of government-sponsored espionage against U.S. firms. "If you're in China with proprietary computer code or formulas that you need to protect, you should realize that these foreign governments aren't going to protect your IT infrastructure," says Hartmann. "Countries like Russia and regions in Asia openly acknowledge that they steal business information."

In China, the main targets for government-sponsored espionage include pharmaceutical, manufacturing, telecommunications and technology businesses, according to intelligence reports and experts.

U.S. technology is just as vulnerable in Russia, according to a recent Vigilinx report. "In Russia, when you set up a network, all your traffic — telephones, mobile phones and any electronic computer data transfers — go through points monitored by Russian agencies," says Mike Assante, Vigilinx's vice president of intelligence and a former U.S. Navy intelligence officer. And if you use encryption, you must register your methodologies and technologies to apply for a license, he adds.

In some countries, a local representative may be the only way for a business to establish a presence, let alone learn the legalities of setting up network operations there.

"I remember trying to get a network connection site into Santo Domingo a few years ago. We couldn't get help from anybody until one of our employees contacted a brother-in-law who worked for the phone company in Santo Domingo," Hancock says.

A local tie is particularly important in South America, where business-to-business networking is growing 162% annually, says Jose Alfonsin, vice president of South American strategic alliances at Digital Defense Inc., a security consultant in San Antonio.

"In South America, the business culture is such that they don't take too well to outsiders. So if you're introduced by a local, your chance of success is much higher," he explains.

Alfonsin, who has had his hand in network operations for many of South

Online Links: Intelligence Sources

PRIVATE-SECTOR RESOURCES

- **www.vigilinx.com** — IT security intelligence services and reports on Russia, China and India ($2,500 per copy)
- **www.crg.com** — Control Risks Group, a consulting firm that offers IT security services; site includes list of terrorist regions in world
- **www.asisonline.org** — The American Society for Industrial Security

GOVERNMENT RESOURCES

- **www.bxa.doc.gov/dpl** — Denied Persons List, Bureau of Export Administration, U.S. Department of Commerce
- **www.ds-osac.org** — Overseas Security Advisory Council, Bureau of Diplomatic Security, U.S. Department of State (travel and cyberwarnings, chiefs of state in foreign governments)

tes

America's largest cement and building equipment makers, says encryption controls aren't a problem for most of the continent. But because e-business is relatively new there, risks from underskilled technology workers running vulnerable machines is a big problem. Data protection is further compounded hy the high rates of internal espionage and embezzlement. And in some countries, hactivism is rampant, he says.

"Local people approach me all the time trying to get business secrets from me," he says. Once, Alfonsin's seatmate oo a flight from Brazil offered him a free laptop "if I would just tell him who I was working with and what they were up to."

What You Do

If an IT manager is familiar with the geopolitically inspired threats in the countries their organizations are moving into, they can better design security policies and controls around these threats. For example, background checks and education, along with regular network security assessments by a tech-savvy outside consultant, will go far to mitigate risks associated with doing business in South America, Alfonsin says. And in known terrorist regions, perimeter security will be your best protection, advises John Braden, U.S. director of managed security operations at Ubizen, a Belgium-based security consulting firm.

"Once you do your risk analysis, you have a list of specific things you must be concerned about in that region," Braden says. "Then look at the assets you have and build a team to address each actioo item."

If the risk is too great, IT managers may decide to severely limit what data flows through networks in certain areas, says Luzwick. "You may have to resort to the lowest commoo denominator," he says. "That may mean delivering hard-copy information for scanning, carrying it out on disk or CD-ROM, or even delivering it from brain to hrain, face to face." ◗

Examples of Global IT Security Threats



SOUTH AMERICA

Risks:
- State-sponsored hactivism
- Insider threat of espionage and embezzlement
- Lack of networkng securnty knowledge among local workforce

Precautions:
- Conduct financal, employment and crnminal background checks on hirees
- Educate employees on security policies and procedures
- Technical controls. strong password and access controls, computer time-outs, password log-on
- Conduct frequent network vulnerability assessments and patch where needed

SOURCE: JOSE ALFONSIN, VICE PRESIDENT FOR SOUTH AMERICAN STRATEGIC ALLIANCES, DIGITAL DEFENSE INC., SAN ANTONIO

MIDDLE EAST

Risks:
- Physical nsk from terronsts where network operations occur
- Forbidden encryption and Internet access in some regions

Precautions:
Implement strong perimeter controls, including:
- Surveillance cameras
- Parking and visitor passes
- Centralized delivery areas
- Employee training (on reporting anything unusual, like unmarked or unregistered vehicles in the delivery or garage areas)
- Card entries and securnty guards
- Biometnc access to the most sensitive areas of buildings

SOURCE: JOHN BRADEN, U.S. DIRECTOR OF MANAGED SECURITY OPERATIONS, UBIZEN INC., RESTON, VA.

RUSSIA

Risks:
- Government-sponsored and rogue hactivism and data snooping
- All data and voice traffic is routed through government-owned switches and hubs
- Only cryptographic systems approved by the Federal Agency of Governmental Communications and Information (FAPSI) may be used

Precautions:
- Be aware that FAPSI will demand access to all technical data it deems necessary to approve a system
- Limit content of all communications to data that might be shared with FAPSI
- Use trusted couners for all other data

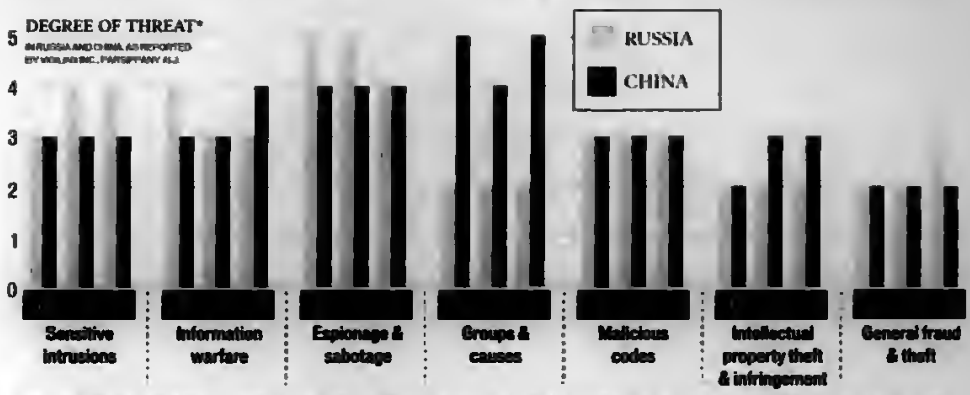
SOURCE: VIDLINK INC., PARSIPPANY, N.J.

CHINA

Risks:
- Rampant software piracy
- Hactivism
- Government-controlled telecommunications companies
- Source code to all security products must be given to the government
- Government-controlled encryption policies

Precautions:
- Limit access to proprietary data. Segment networks and employ intrusion detection
- Maintain physical securnty barriers
- Maintain and routinely revalidate electronic security measures and tools
- Develop contingency plans and incident-response procedures

SOURCE: WIDLINK



*Threat axis index level definitions: **0** – nonexistent; no cases reported, no damage. **1** – low; isolated incidents reported; damage is none to minor. **2** – sporadic; episodes of increased activity followed by a return to lower levels, minor to major damage. **3** – moderate; incidents reported monthly; minor to major damage. **4** – common, incidents reported weekly; minor to severe damage. **5** – pervasive; incidents occur almost daily; minor to severe damage.

tes

America's largest cement and building equipment makers, says encryption controls aren't a problem for most of the continent. But because e-business is relatively new there, risks from underskilled technology workers running vulnerable machines is a big problem. Data protection is further compounded by the high rates of internal espionage and embezzlement. And in some countries, hactivism is rampant, he says.

"Local people approach me all the time trying to get business secrets from me," he says. Once, Alfonsin's seatmate on a flight from Brazil offered him a free laptop "if I would just tell him who I was working with and what they were up to."

What You Do

If an IT manager is familiar with the geopolitically inspired threats in the countries their organizations are moving into, they can better design security policies and controls around these threats. For example, background checks and education, along with regular network security assessments by a tech-savvy outside consultant, will go far to mitigate risks associated with doing business in South America, Alfonsin says. And in known terrorist regions, perimeter security will be your best protection, advises John Braden, U.S. director of managed security operations at Ubizen, a Belgium-based security consulting firm.

"Once you do your risk analysis, you have a list of specific things you must be concerned about in that region," Braden says. "Then look at the assets you have and build a team to address each action item."

If the risk is too great, IT managers may decide to severely limit what data flows through networks in certain areas, says Luzwick. "You may have to resort to the lowest common denominator," he says. "That may mean delivering hard-copy information for scanning, carrying it out on disk or CD-ROM, or even delivering it from brain to brain, face to face." ◗

Examples of Global IT Security Threats



SOUTH AMERICA

Risks:

- State-sponsored hactivism
- Insider threat of espionage and embezzlement
- Lack of networking security knowledge among local workforce

Precautions:

- Conduct financial, employment and criminal background checks on hirees
- Educate employees on security policies and procedures
- Technical controls: strong password and access controls, computer time-outs, password log-on
- Conduct frequent network vulnerability assessments and patch where needed

SOURCE: JOSE ALFONSIN, VICE PRESIDENT FOR SOUTH AMERICAN OPERATIONS AT ALLIANCE DIGITAL DEFENSE INC., SAN ANTONIO

MIDDLE EAST

Risks:

- Physical risk from terrorists where network operations occur
- Forbidden encryption and Internet access in some regions

Precautions:

Implement strong perimeter controls, including:

- Surveillance cameras
- Parking and visitor passes
- Centralized delivery areas
- Employee training (on reporting anything unusual, like unmarked or unregistered vehicles in the delivery or garage areas)
- Card entries and security guards
- Biometric access to the most sensitive areas of buildings

SOURCE: JOHN BRADEN, U.S. DIRECTOR OF MANAGED SECURITY OPERATIONS, UBIZEN NV, PRESTON, U.K.

RUSSIA

Risks:

- Government-sponsored and rogue hactivism and data snooping
- All data and voice traffic is routed through government-owned switches and hubs
- Only cryptographic systems approved by the Federal Agency of Governmental Communications and Information (FAPSI) may be used

Precautions:

- Be aware that FAPSI will demand access to all technical data it deems necessary to approve a system
- Limit content of all communications to data that might be shared with FAPSI
- Use trusted couriers for all other data

SOURCE: [illegible]

CHINA

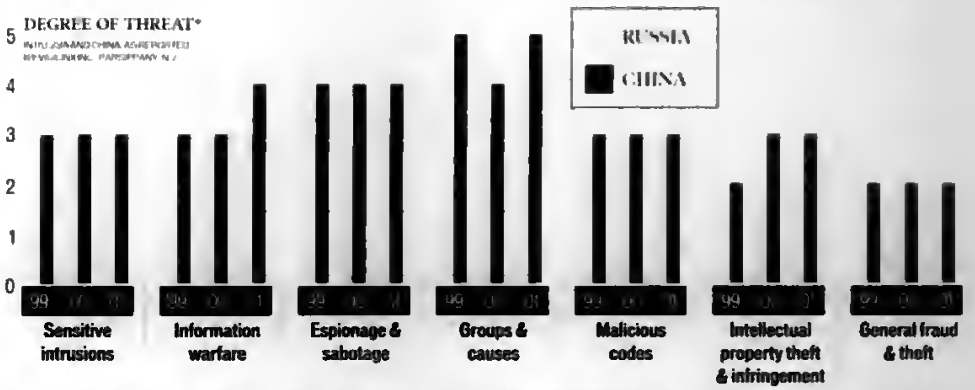
Risks:

- Rampant software piracy
- Hactivism
- Government-controlled telecommunications companies
- Source code to all security products must be given to the government
- Government-controlled encryption policies

Precautions:

- Limit access to proprietary data. Segment networks and employ intrusion detection
- Maintain physical security barriers
- Maintain and routinely revalidate electronic security measures and tools
- Develop contingency plans and incident-response procedures

SOURCE: [illegible]



*Threat axis index level definitions: **0** – nonexistent: no cases reported, no damage; **1** – low: isolated incidents reported; damage is none to minor; **2** – sporadic: episodes of increased activity followed by a return to lower levels; minor to major damage; **3** – moderate: incidents reported monthly; minor to major damage; **4** – common: incidents reported weekly; minor to severe damage; **5** – pervasive: incidents occur almost daily; minor to severe damage

KATHLEEN MELYMUKA/DIVERSITY

Finding a Safe Haven for Respect

THE WEEK AFTER the catastrophic terrorist attacks on the U.S., I contacted as many Muslim American IT workers as I could find to see whether they were being subjected to backlash.

Those I was able to reach were all doing fairly well. Although they were uneasy about their safety on the street, they said their co-workers had rallied around them and that, overall, they felt "lucky." We shared some black humor about the irony of some Americans feeling lucky that other Americans weren't attacking them.

But one acquaintance, Mohanbir Sawhney, ooted that Muslim Americans in IT were feeling safe at work because they are known at work.

"Ignorance is the root cause of intolerance," he says. "We in IT live in a privileged sectioo of society. We're oot representative of the guy in the street — of the ignorance that causes the discrimination — or of the guy on the receiving end. The people who will be hurt are the guys in the gas stations and in the convenience stores. My heart goes out to those guys."

Though not a Muslim himself, Sawhney is in a minority that is among the most at risk in the backlash against Islam.

He grew up in India and got his engineering degree and MBA there. He came to the U.S. in 1989 to get a doctorate io marketing from The Wharton School at the University of Pennsylvania in Philadelphia and has been teaching at the Kellogg School of Managemeot at Northwestern University in Evanston, Ill., since 1993. He heads the technology and e-commerce group at Kellogg and is the director of the Research Center on Technology and Innovation.

He teaches 250 MBA students per year, speaks to 5,000 executives at various conferences, serves on the advisory boards of dozens of corporations and has consulted for 25 Fortune 500 companies.

Sawhney is also a follower of the Sikh religion, and he's among the people most at risk because his religious beliefs require him to wear a turbao and keep a beard.



KATHLEEN MELYMUKA is a *Computerworld* feature writer. Contact her at kathleen_melymuka@computerworld.com.

"It seems that we may be setting ourselves up for another tragedy: the tragedy of intolerance against people simply based on their appearance or ethnic background," he says.

"Sikhs are a peaceful, enterprising and productive community," he says. "We consider ourselves as patriotic as any other community."

Unfortunately, all the pictures of Osama bin Laden and Taliban leaders, who all wear turbans and have beards, and the general ignorance of Americans about who Sikhs are have resulted in more than 250 hate crimes against the Sikh community, including a fatal shooting of a gas station attendant in Arizona by a sick, self-styled "patriot."

"The only way to combat intolerance is to educate people about different races and ethnicities and to convince them that not all Muslims are terrorists, that Sikhs aren't the Taliban just because they wear turbans," Sawhney says.

"We don't want to go out and tell people, 'Look, I'm not Muslim,' because that implies there's something bad about Muslims. At the same time, people need to appreciate differences," be says.

"We may look different, but we are just as American as they come," Sawhney says.

Sawhney is proud of his identity and proud that it sets him apart. But he says he's concerned about his family, including his 3-year-old son, who wears a little turban, and his 5-year-old daughter.

"Kids can be pretty intolerant," he observes.

Like other innocents wbose etbnicity or religion makes them suspect in the eyes of the ignorant, Sawhney has found a safe haveo at work, where be is known and appreciated as an individual.

But several of Sawhney's Sikh friends have been harassed and verbally abused. One, a partner at a law firm, was stopped by local police for no apparent reason while driving home, he says. And their temples have been attacked.

"This is what the terrorists set out to accomplish — to tear apart the fabric of U.S. society," Sawhney says. "We're playing into their hands. Ninety-eight percent of people doo't think this way, but we've just seen that a very, very small minority can create disproportionate damage."

Sawhney says it's futile to preach tolerance, but we can at least attack ignorance and hope that awareness leads to a better appreciation of diversity and the strength it brings us as a nation.

"Diversity is what makes us what we are," he says. "If we doo't understand that, we may win the war in Afghanistan but lose the war at home."

Portals: Build Them Right And They Will Come

Fast on their way to becoming the primary way professionals share information, portals are red hot within organizations today. But to paraphrase a popular movie, if you build a portal, will they come? And if users come, will they stay?

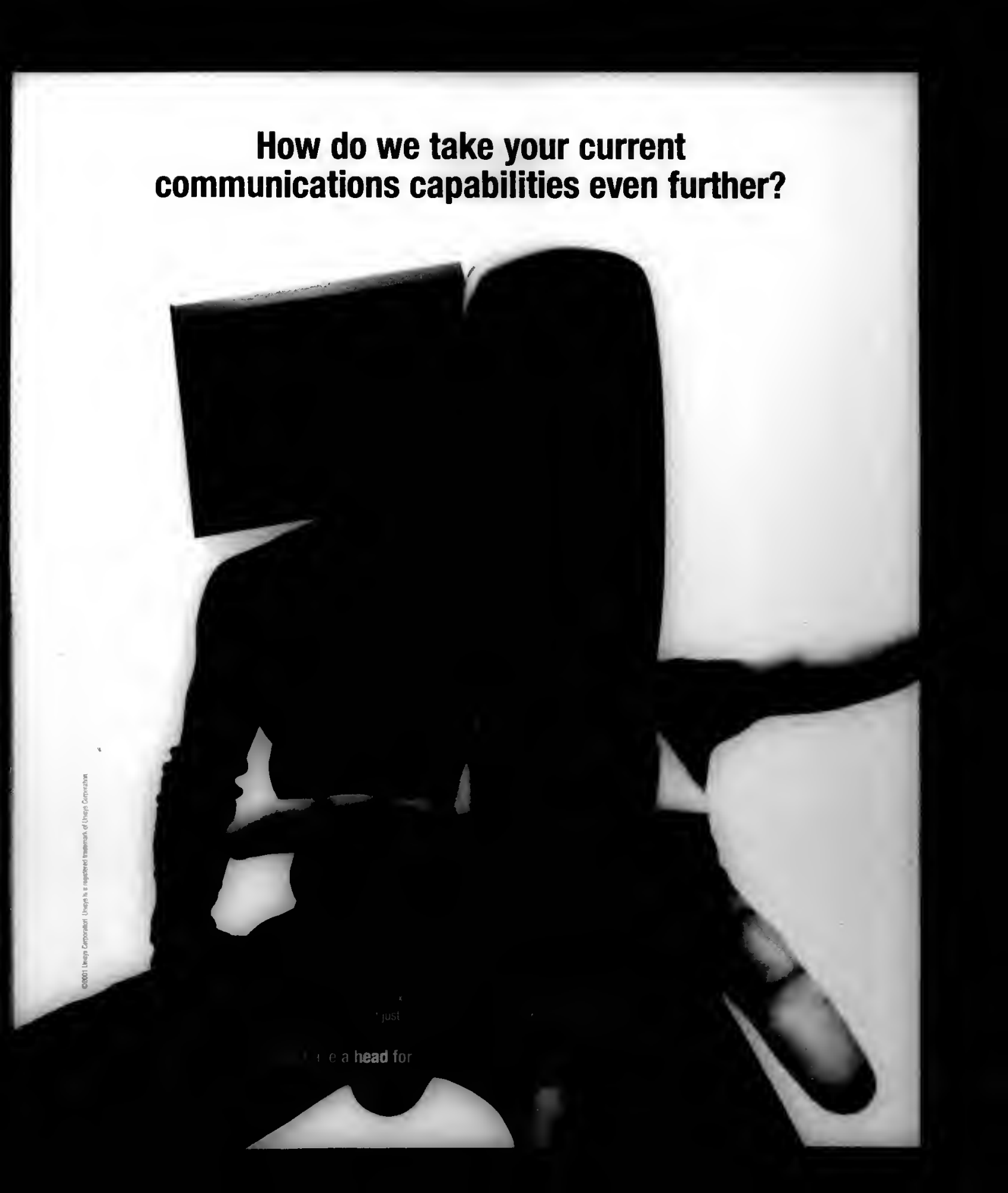
The short answer is, "not necessarily." The reason is that firms don't always don't take a true customer-centric approach to building portals to assure an optimal user experience. Moreover, firms frequently underestimate the complexity of integrating legacy data and other information sources to be linked with portals.

"When building portals, you need to think in terms of end to end business outcomes and the complete lifecycle," notes Terry Hisey, V. P. and G. M., e-Business at Unisys. "The corporate portal begins with an alignment between business and portal strategies incorporating the right information, from whatever source, and delivering it in a productive and time-sensitive manner to a personalized interface."

To make this dream a reality for clients, Unisys has combined its rock-solid experience in consulting and integration with breakthrough patent-pending methodologies. To learn how Unisys can help conceive, build and manage world-class portals, visit: www.aheadforebusiness.com

UNISYS
We have a head for e-business.

How do we take your current communications capabilities even further?



©2001 Unisys Corporation. Unisys is a registered trademark of Unisys Corporation.

just

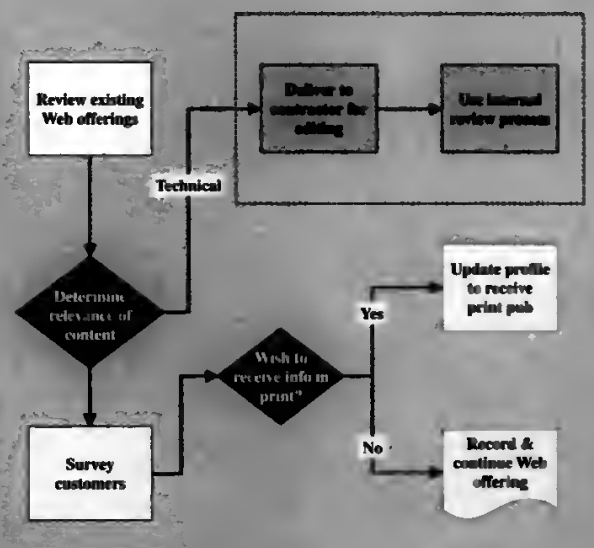
e a head for



Microsoft Visio

© 2001 Microsoft Corporation. All rights reserved. Microsoft, Visio, and the Office logo are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

See what I'm saying?



There was a particular stroke of genius early in this brainstorming session. New Microsoft® Visio® 2002 allows you to quickly and easily organize your ideas and present a clear-cut plan of action. Create crystal-clear flowcharts, timelines, organizational charts, even detailed floor plans, all in an intuitively designed, easy-to-use program. With Visio your ideas become easily understood solutions. And with the flexibility to save Visio diagrams as Web pages or to use them in Microsoft Office documents and e-mail, you can get your point across just about any way you choose. **To give it a try, visit microsoft.com/visio or go to Internet Keyword: Microsoft Visio.** Software for the Agile Business.

Microsoft

Book Reviews:

Be Forward-Thinking And Master Your Competitors

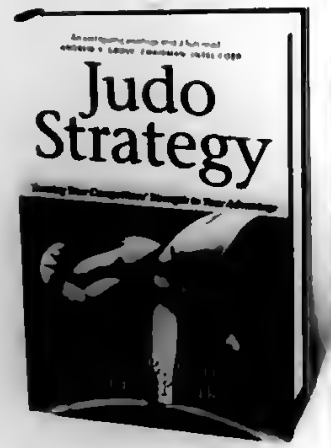
Leverage your rivals' strengths, defy conventional wisdom, and help your employees accept change.

Judo Strategy: Turning Your Competitors' Strength to Your Advantage, *by David B. Yoffie and Mary Kwak (Harvard Business School Press, 239 pages, $29.95).* Anyone who has studied judo or other martial arts has been taught to utilize an opponent's size and strength to bring him down instead of struggling with him using a similar amount of force. Yoffie, a Harvard Business School professor, and Kwak, a research associate at Harvard Business School, advise managers to beat competitors of all sizes using three judo principles — movement, balance and leverage.

Case in point: In one chapter, the authors point to the success of RealNetworks Inc. and how, through a combination of balance and vision, the company continues to deliver 85% of all streaming media content to the industry five years after its launch, despite the efforts and resources of its gargantuan rival, Microsoft Corp.

Yoffie and Kwak successfully follow through on a simple approach that delivers useful advice for any manager.

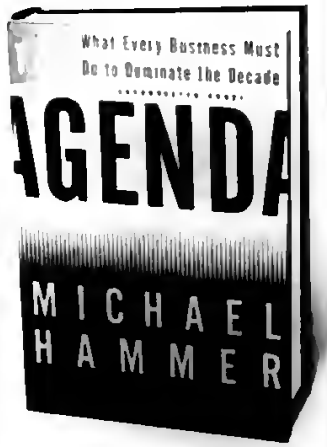
— Thomas Hoffman



The Forward-Focused Organization: Visionary Thinking and Breakthrough Leadership to Create Your Company's Future, *by Stephen C. Harper (Amacom Books, 258 pages, $19.56).* Harper, a management professor at the University of North Carolina at Wilmington and president of a consulting firm, writes about the latest strategies to help corporate managers be forward-looking. He offers ideas on fostering speed and agility, adapting the best entrepreneurial thinking, and cultivating strategic management by having leaders set a goal of where they want the company to be in a few years, then working back from that target date to determine how to get there. Make note of these two appendices: 100 Ways to Self-Destruct as a Leader and 100 Ways to Drive Away Your Customers.

— Rick Saia

The Agenda: What Every Business Must Do to Dominate the Decade, *by Michael Hammer (Crown Business, 264 pages, $27.50).* It has been eight years since Hammer published his best-selling business tome, *Reengineering the Corporation*, which ultimately sent thousands of managers scrambling to try to reform their organizations' business operations. This time, Hammer preaches that the recent market decline from the go-go 1990s is forcing businesses to "get serious" and succeed by thinking like their customers.



Though Hammer is hardly the first management consultant to jump on the "think customercentric" bandwagon, his keen insights offer valuable lessons for today's earnings-focused managers.

— Thomas Hoffman

Build Your Own Garage: Blueprints and Tools to Unleash Your Company's Hidden Creativity, *by Bernd H. Schmitt and Laura Brown (The Free Press, 196 pages, $19.60).* The "bizz" and the "buzz." The first comprises the fundamental rules, procedures and principles of management action. The latter is a motivational atmosphere of excitement, job satisfaction and fun to enable your organization to become a creative powerhouse. The authors contend that companies shouldn't focus too much on just one of those areas.

Schmitt and Brown use the idea of a "garage" as a place where creativity and innovation are the highest priorities, a place where bureaucracy is banished and where ideas are quickly implemented.

— Rick Saia

Managing Business Change for Dummies, *by Beth L. Evard and Craig A. Gipple (Hungry Minds Inc., 340 pages, $15.39).* It's common for companies to change, and only human to resist it. But as a manager, you play a crucial role when your company is going through a transformation.

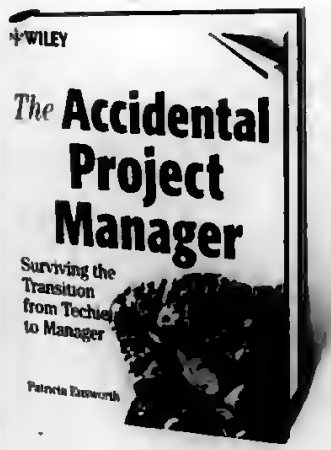
Evard, an organizational psychologist, and Gipple, a change management and quality consultant, offer advice and suggest questions to ask yourself when employees resist change, when they need information and when change stresses them out.

— Rick Saia

The Accidental Project Manager: Surviving the Transition from Techie to Manager, *by Patricia Ensworth (John Wiley & Sons, Inc., 269 pages, $34.99).* If you were ever a programmer who was suddenly "volunteered" to run a complex IT project with little or no project management experience, you know that standards-based disciplines such as Six Sigma and the Capability Maturity Model will only get you so close to the finish line. So does Ensworth. The vice president of systems development and manager of software quality assurance at Moody's Investors Service in New York, she has 20 years experience in software development.

Unlike tech manuals that might guide you with gobs of quality assurance methodologies, Ensworth's book provides lots of hands-on advice for newbie project managers, like how to contend with co-worker quarrels or amorous liaisons that might develop during a project. Still, the book has plenty of procedural guidance about how to tackle more mundane but necessary tasks such as performance testing and documentation.

— Thomas Hoffman



Book Reviews:

Be Forward-Thinking And Master Your Competitors

Leverage your rivals' strengths, defy conventional wisdom, and help your employees accept change.

Judo Strategy: Turning Your Competitors' Strength to Your Advantage, *by David B. Yoffie and Mary Kwak (Harvard Business School Press, 239 pages, $29.95).* Anyone who has studied judo or other martial arts has been taught to utilize an opponent's size and strength to bring him down instead of struggling with him using a similar amount of force. Yoffie, a Harvard Business School professor, and Kwak, a research associate at Harvard Business School, advise managers to beat competitors of all sizes using three judo principles — movement, balance and leverage.

Case in point: In one chapter, the authors point to the success of RealNetworks Inc. and how, through a combination of balance and vision, the company continues to deliver 85% of all streaming media content to the industry five years after its launch, despite the efforts and resources of its gargantuan rival, Microsoft Corp.

Yoffie and Kwak successfully follow through on a simple approach that delivers useful advice for any manager.

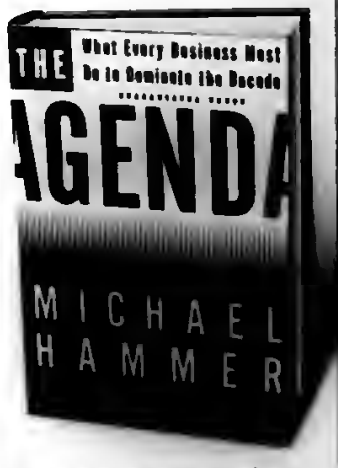
— Thomas Hoffmon



The Forward-Focused Organization: Visionary Thinking and Breakthrough Leadership to Create Your Company's Future, *by Stephen C. Harper (Amacom Books, 258 pages, $19.56).* Harper, a management professor at the University of North Carolina at Wilmington and president of a consulting firm, writes about the latest strategies to help corporate managers be forward-looking. He offers ideas on fostering speed and agility, adapting the best entrepreneurial thinking, and cultivating strategic management by having leaders set a goal of where they want the company to be in a few years, then working back from that target date to determine how to get there. Make note of these two appendices: 100 Ways to Self-Destruct as a Leader and 100 Ways to Drive Away Your Customers.

— Rick Saia

The Agenda: What Every Business Must Do to Dominate the Decade, *by Michael Hammer (Crown Business, 264 pages, $27.50).* It has been eight years since [illegible] published his best-selling business tome, *Reengineering the Corporation*, which ultimately sent thousands of managers scrambling to try to reform their organizations' business operations. This time, Hammer preaches that the recent market decline from the go-go 1990s is forcing businesses to "get serious" and succeed by thinking like their customers.



Though Hammer is hardly the first management consultant to jump on the "think customercentric" bandwagon, his keen insights offer valuable lessons for today's earnings-focused managers.

— Thomas Hoffman

Build Your Own Garage: Blueprints and Tools to Unleash Your Company's Hidden Creativity, *by Bernd H. Schmitt and Laura Brown (The Free Press, 196 pages, $19.60).* The "bizz" and the "buzz." The first comprises the fundamental rules, procedures and principles of management action. The latter is a motivational atmosphere of excitement, job satisfactioo and fun to enable your organization to become a creative powerhouse. The authors contend that companies shouldo't focus too much oo just one of those areas.

Schmitt and Brown use the idea of a "garage" as a place where creativity and innovation are the highest priorities, a place where bureaucracy is banished and where ideas are quickly implemeoted.

— Rick Saia

Managing Business Change for Dummies, *by Beth L. Evard and Craig A. Gipple (Hungry Minds Inc., 340 pages, $15.39).* It's common for companies to change, and only human to resist it. But as a manager, you play a crucial role when your company is going through a transformation.

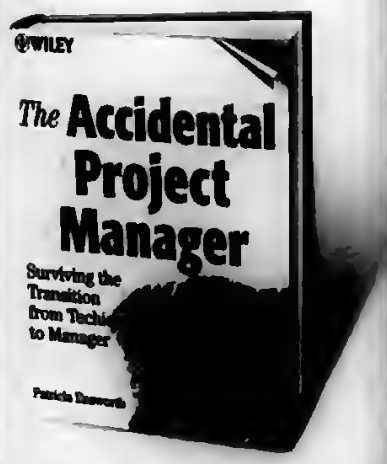
Evard, an organizational psychologist, and Gipple, a change management and quality consultant, offer advice and suggest questions to ask yourself when employees resist change, when they need information and when change stresses them out.

— Rick Saio

The Accidental Project Manager: Surviving the Transition from Techie to Manager, *by Patricia Ensworth (John Wiley & Sons, Inc., 269 pages, $34.99).* If you were ever a programmer who was suddenly "volunteered" to run a complex IT project with little or no project management experience, you know that standards-based disciplines such as Six Sigma and the Capability Maturity Model will only get you so close to the finish line. So does Ensworth. The vice president of systems development and manager of software quality assurance at Moody's Investors Service in New York, she has 20 years experience in software development.

Unlike tech manuals that might guide you with gobs of quality assurance methodologies, Ensworth's book provides lots of hands-oo advice for newbie project managers, like how to contend with co-worker quarrels or amorous liaisons that might develop during a project. Still, the book has plenty of procedural guidance about how to tackle more mundane but necessary tasks such as performance testing and documentation.

— Thomas Hoffman





Stop Searching.

Start Finding.

Introducing Computerworld's Knowledge Centers. All the information you need. All in one place.

Are you tired of scouring the Web to find the IT resources you need to do your job? Then go to Computerworld online at www.computerworld.com.

It's the one place where you can find the insightful, award-winning editorial found in Computerworld – plus links to a wealth of quality tools.

VISIT COMPUTERWORLD'S KNOWLEDGE CENTERS:

- CRM
- Application/ Web Development
- Data Management
- E-Commerce
- XSP
- ERP/Supply Chain
- Hardware
- IT Management/Leadership
- Mobile/Wireless
- Networking
- Operating Systems
- Security
- Storage
- Website Management

Subscribe to more than twenty online newsletters. Buy business and IT books. Discuss IT issues with peers and experts. Check out upcoming IT events and training programs. Even submit RFPs to find the IT resources you need to succeed.

Better yet, it's all organized by the most popular areas of interest in IT. So you can quickly find what you need to do your job. Go to www.computerworld.com/knowledge_centers now. The search is over.

At Computerworld's Knowledge Centers you can catch up on the latest breaking news. Search for white papers on a wide range of technical topics.

www.computerworld.com/knowledge_centers

COMPUTERWORLD
INFORMATION SERVICES FOR IT LEADERS

AGGREGATION: HOSTED TODAY, IN-HOUSE TOMORROW

While most banks that have implemented aggregation services over the past year are using a hosted model, a growing number of them are expected to turn to in-house connections as the technology matures and standards emerge. By Lucas Mearian

WHILE ACCOUNT aggregation is one of the hottest services being offered online by financial services firms, few organizations are managing the technology themselves. Most are opting to use hosted models just to get their service up and running quickly.

But as aggregation technologies mature and standards emerge, more banks will likely look to bring the systems in-house to avoid perennial user fees and to increase control and scalability.

RBC Financial Group in Toronto recently started piloting its aggregation service with a select group of high-use, online customers after performing a two-month, in-house test of the service. The service itself is being hosted by CashEdge Inc. in Milpitas, Calif., the same company that hosts the firm's online banking service.

"We weren't really comfortable offering our customers a service on a third-party site where we were disintermediated and [the] third party might have access to our customer information," said Tom Wolf, RBC's senior vice president of e-business. But with CashEdge hosting both the bank's aggregation service and its online banking activities, he says, "you're behind the same authentication process you have for our online banking."

In the first two days that RBC's aggregation service was online, 320 out of 1,000 customers indicated that they wanted to try it. By the end of August, that number had jumped to 420.

Farming It Out

The vast majority of financial services firms lean upon aggregation service providers such as Yodlee Inc., S1 Corp. or CashEdge to host their aggregation sites. With about 80% of the market, Redwood City, Calif.-based Yodlee is the aggregation industry's 800-pound gorilla.

Ray Graber, a commercial banking analyst at TowerGroup in Needham, Mass., says banks overcame their squeamishness about the security of hosted sites and began jumping into aggregation through service providers because they feared being left behind as the industry began adopting the technology.

"My sense is that long term, as aggregation grows, it will be available from all technology providers as an on-site service," Graber said.

James Van Dyke, research director at Jupiter Research in New York, says the hosted aggregation model is still the most economical and fastest way for most financial services firms to deliver the service to customers. "My view is the ASP model works fine for general-purpose financial institutions — banks and other companies where wealth management is not the priority. It's quick and relatively painless, and they can say we have it," Van Dyke says. "[But] if somebody wants to make it a core part of their offering, they should look at on-site models."

That's one of the reasons why Tom Cable, chief technology officer at NetBank Inc. in Alpharetta, Ga., chose to develop an in-house aggregation service based on technology from Palo Alto, Calif.-based Teknowledge Corp.

Cable says that by integrating the system with the bank's current online technology, it should be cheaper for the bank to host the system itself over the long haul because his company won't have to pay per-use or monthly fees that it would have to pay under a hosted model.

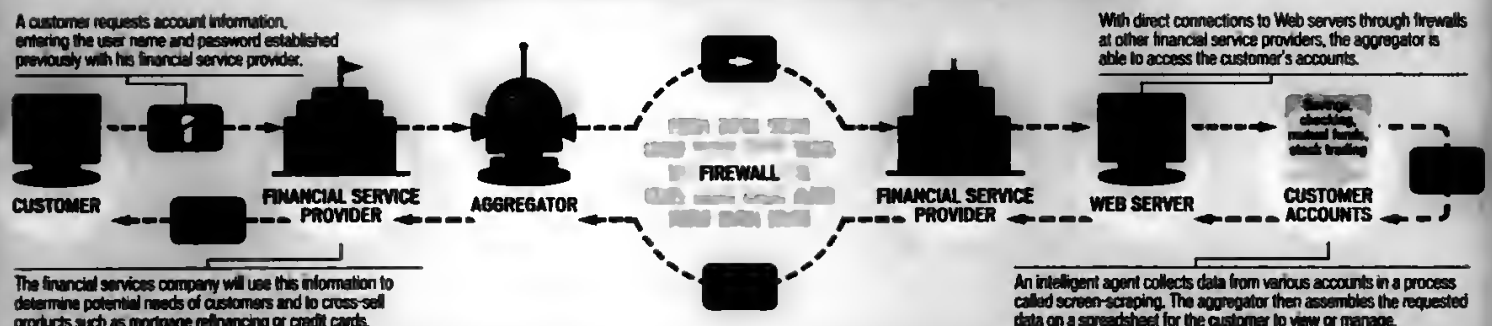
NetBank, which claims to be the largest online-only bank with $2.2 billion in deposits and 230,000 accounts, used a clustered server architecture to build a database to house all of the aggregated information and to run a screen-scraping function, which gathers customer account information from other firms' Web servers.

"We went this route because it would give us better integration with our Internet package instead of just linking to someone else's site," says Cable. Besides, he adds, "it gives us more control. And we don't have to worry about a third party having that information and what they may do with it without our permission." ▶

WHAT IS IT?

Financial aggregation *is a technique used by banks and other financial services firms to gather* **customer data** *from multiple sources, such as savings, credit card and brokerage accounts, and* **consolidate** *that information at a single Web site. The goal is to use that data to* **cross-sell** *additional products, such as home mortgages or credit cards.*

SCREEN-SCRAPING ACROSS THE WEB



AGGREGATION: HOSTED TODAY, IN-HOUSE TOMORROW

While most banks that have implemented aggregation services over the past year are using a hosted model, a growing number of them are expected to turn to in-house connections as the technology matures and standards emerge. By Lucas Mearian

WHILE ACCOUNT aggregation is one of the hottest services being offered online by financial services firms, few organizations are managing the technology themselves. Most are opting to use hosted models just to get their service up and running quickly.

But as aggregatioo technologies mature and standards emerge, more banks will likely look to bring the systems in-house to avoid perennial user fees and to increase control and scalability.

RBC Financial Group in Toronto recently started piloting its aggregation service with a select group of high-use, online customers after performing a two-month, in-house test of the service. The service itself is being hosted by CashEdge Inc. in Milpitas, Calif., the same company that hosts the firm's online banking service.

"We weren't really comfortable offering our customers a service on a third-party site where we were disintermediated and [the] third party might have access to our customer information," said Tom Wolf, RBC's senior vice president of e-business. But with CashEdge hosting both the bank's aggregation service and its online banking activities, he says, "you're behind the same authentication process you have for our online banking."

In the first two days that RBC's aggregation service was online, 320 out of 1,000 customers indicated that they wanted to try it. By the end of August, that number had jumped to 420.

Farming It Out

The vast majority of financial services firms lean upon aggregation service providers such as Yodlee Inc., S1 Corp. or CashEdge to host their aggregation sites. With about 80% of the market, Redwood City, Calif.-based Yodlee is the aggregation industry's 800-pound gorilla.

Ray Graber, a commercial banking analyst at TowerGroup in Needham, Mass., says banks overcame their squeamishness about the security of hosted sites and began jumping into aggregation through service providers because they feared being left behind as the industry began adopting the technology.

"My sense is that long term, as aggregation grows, it will be available from all technology providers as an on-site service," Graber said.

James Van Dyke, research director at Jupiter Research in New York, says the hosted aggregation model is still the most economical and fastest way for most financial services firms to deliver the service to customers. "My view is the ASP model works fine for general-purpose financial institutions — banks and other companies wbere wealth management is not the priority. It's quick and relatively painless, and they can say we have it," Van Dyke says. "[But] if somebody wants to make it a core part of their offering, they should look at oo-site models."

That's one of the reasons why Tom Cable, chief technology officer at NetBank Inc. in Alpharetta, Ga., chose to develop an in-house aggregation service based on technology from Palo Alto, Calif.-based Teknowledge Corp.

Cable says that by integrating the system with the bank's curreot online technology, it should be cheaper for the bank to host the system itself over the long haul because his company won't have to pay per-use or monthly fees that it would have to pay under a hosted model.

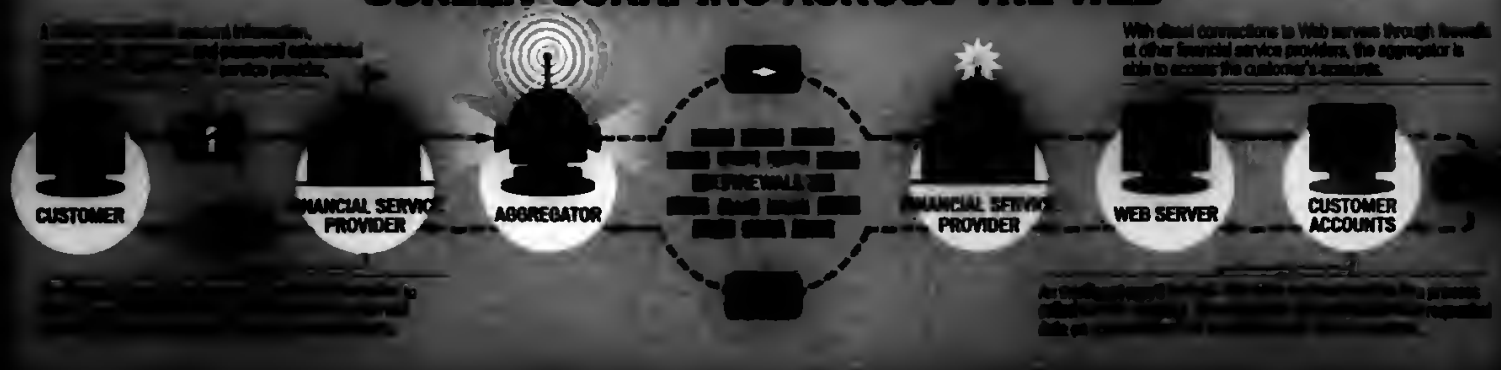
NetBank, which claims to be the largest online-only bank with $2.2 billion in deposits and 230,000 accouots, used a clustered server architecture to build a database to house all of the aggregated information and to run a screen-scraping function, which gathers customer account informatioo from other firms' Web servers.

"We went this route because it would give us better integratioo with our Internet package instead of just linking to someone else's site," says Cable. Besides, he adds, "it gives us more control. And we doo't have to worry about a third party having that information and what they may do with it without our permission." ◗

WHAT IS IT?

***Financial aggregation** is a technique used by banks and other financial services firms to gather **customer data** from multiple sources, such as savings, credit card and brokerage accounts, and **consolidate** that information at a single Web site. The goal is to use that data to **cross-sell** additional products, such as home mortgages or credit cards.*

SCREEN-SCRAPING ACROSS THE WEB




not here.


here.

infrastructure: it starts with you.

When you left the office last night, you worked for a Midwest-based enterprise humming nicely along with ten accounts.

When you walked in this morning, you were greeted by an e-mail announcing that you just landed a new piece of business—which happens to be bigger than those same ten accounts combined.

What's at the top of today's to-do list? Figure out how to expand your supply chain and create distribution channels to service all of your client's retail locations around the world. And could you do it by tomorrow, thank you?

Hopefully, you've got an infrastructure that's built on technology that works around your needs, not the other way around. It should be standards-based, so you're limiting your risk. Adaptable, so you can quickly adjust to change. Reliable, so you're up and running without a hitch.

At HP, we engineer infrastructure that starts with you—your business, your issues, your opportunities. So you can easily respond as your business expands, contracts or takes off in new directions.

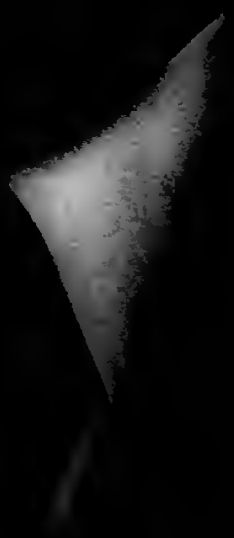
Servers that are designed to address the critical nature of an always-on Internet infrastructure. Software that puts your entire network within easy reach of your keyboard. Storage that enables you to transparently scale your capacity. Service professionals to help you quickly design and deploy flexible solutions and infrastructures. As well as the support resources to help keep them running 24/7.

HP infrastructure solutions are based in the real world of business. Because the last time we checked, that's where we all work. Call 1.800.HPASKME, ext. 246. Or visit hp.com/go/infrastructure.



wonder how those
who have all the answer
all the answers?





sas

WORKSTYLES

Helping to Map The Code of Life

Customer base: Pharmaceuticals companies and university, medical and government research centers

Mission-critical systems: "Our supercomputing system, which includes the servers, the storage and the computer farm [800 interconnected Compaq Alpha-based, 64-bit systems, each of which can perform more than 250 billion sequence comparisons per hour]. It's one of the largest civilian supercomputing centers in the world.

"We have a strong relationship with corporate IT at Applera [Corp., Celera's parent company], so we bridge into their [back-office] systems. Here, the focus is on supercomputing and local enterprise systems, like desktop systems, [customer relationship management and] sales support."

How did IT contribute to the human genome project? "It wouldn't have been possible to [sequence and assemble] the genome so quickly without our systems. We did it in nine months. We could have done it on laptops, maybe, in a few hundred years. We have a very powerful supercomputer and 100TB of information stored on disk. That's larger than the distributed storage at most classified computing complexes.

"The DNA is mechanically sheared into pieces in a lab. Then we have hundreds of DNA sequencers that analyze the pieces and decipher the order in which the [chemical bases] appear. We then use our supercomputer and proprietary algorithms to put all the pieces back together and see what the genome looks like."

What does it take to work in this type of IT environment? "Agility — you must be able to respond to many different requirements as they arise because our business is research-driven, and we have to mobilize resources very quickly based on what our scientists are coming up with.

"We also need folks who can understand and manage scale. We have over a terabyte of storage in a single Oracle database, so we're asking people to manage systems that are one to two orders of magnitude larger than they've ever seen before.... Someone may call from [research], and we'll move, without blinking an eye, more data between two boxes than exists at most companies.

"You must also have a customer focus — you have to understand the user and their requirements, which are driven by their research agenda and the online information business and its customers. Finally, we've proven that we can do things very fast and efficiently, and that requires attention to quality."

Where do you find people with all of those attributes? "Different IT environments bring different characteristics to the team. From the academic environment, we get a level of creativity and research understanding. From the government sector, we see people who have been exposed to the scale — the largest computers in the world sit in government agencies, so they have an appreciation of our scale and mission. From industry, we get the attention to quality and customer focus. So we draw from all these communities to build our IT culture."

IT training: "Everyone goes to a genomic boot camp, a quick-and-dirty two-day session to learn the basics of genomics. In IT we do a lot of on-the-job training because there aren't a lot of places that have what we have in terms of the amount of data and power. To us, the most valuable form of training is collaboration with other sites like Sandia [National Laboratories] or Los Alamos [National Laboratory] — we share experiences in running systems of this scale, and that's where we get the most valuable form of training."

Workday: "That can vary depending on what the workload is. Typically, it's a 50-hour week, and it can bubble up to 60 or 70 hours. But we're a 7/24 shop, so the hours can be very flexible."

Dress code: "Yes, we wear clothes. That's about the extent of our dress code."

Little perks: "We try to be creative, and to celebrate as much as possible. We have crab cake dinners and ice cream socials. And we have Nerf ball battles."

Would you ever go back into a more traditional IT environment? "Once you've been to Paris, it's kind of hard to go back to the farm. It's difficult to find such a diverse set of exciting challenges as we have here — something that has this impact, the scale, the algorithmic challenges."

– Leslie Jaye Goff
lgoff@ix.netcom.com



Celera Genomics

Interviewee: John Reynders, vice president of information systems

Company: Celera Genomics (*www.celera.com*), the company that mapped the human genome

Type of business: Provider of genomic and biological data and software tools for viewing, browsing and analyzing the data

Main location: Rockville, Md.

Number of IT employees: 90

Number of employees (end users): 800 internally; information systems also supports customers of the company's data and software

SAS helped Sprint improve customer retention and save a million dollars. But we'll let them tell you all about it.

sas


Storage and data netw
unite.
Information is shared and managed globally.
Discover all that s
VPN/SECURITY
IP TELEPHONY
CONTENT NETWORKING
OPTICAL
MOBILITY
cisco.com/go/storagesolutions
Now you can make storage resources available anywhere over IP by establishing a system based on open standards. With Cisco storage solutions, you can consolidata storage resources over your existing IP network — enabling you to save money while deploying and managing the most demanding storage application. With Cisco AVVID enterprise architecture, you can do all this without any disruption. This standardized enterprise architecture allows you to seamlessly integrate voice, video, wireless, storage and data applications on a singla, scalabla network. This includes new and existing technologies alike. Whether you're building your enterprise network or extending it with Cisco Powered Network services, take advantage of the tools below to get it done right.
Cisco Systems
Empowering the Internet Generation™

Dear Career Adviser:

I'm a Cisco-certified trainer who's interested in getting a government job. The paperwork seems endless, plus I understand you get in by knowing someone. Am I right?

— INSIDERS ONLY

Dear Only:

Insider support helps, no matter what organization you're applying to.

However, both Dennis Damp, author of *The Book of U.S. Government Jobs* (Seventh Edition, Brookhaven Press, 2000) and the *Quick and Easy Federal Jobs Kit, Version 6.0* (Brookhaven Press, 2001), and Sharon Patterson, a marketing specialist at Federal Research Service Inc., in Vienna, Va., point out that another key to getting hired by Uncle Sam involves acing the application process.



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Written tests are required for perhaps only one-fifth of government jobs. To survive the application process, you'll need to go to school to tailor your responses to the keywords, key experiences and education requirements listed in each job description. This can be time-consuming indeed.

To find the job openings themselves, go to *www.federaljobs.net*, which has links leading to the employment opportunities pages on the Web sites of about 150 federal agencies.

You can also search through approximately 60% of the jobs available in the federal government via the Web site of the U.S. Office of Personnel Management. (*www.usajobs.opm.gov/a6.htm*).

The IT occupational job codes you're looking for are 0334, for computer specialist, programmer/analyst; 0854, for computer engineer; 1550, for computer scientist; and 0332, for computer operator.

For a subscription fee, you can search through 100% of available federal listings at *www.fedjobs.com*.

You can also find the names of companies that have been awarded government contracts by reading *Federal Computer Week* (*www.fcw.com*), *Government Computer News* (*www.gcn.com*) and *Commerce Business Daily* (*http://cbdnet.access.gpo.gov/*).

Dear Career Adviser:

I've been job-hunting in New York with absolutely no luck. I have eight years of IT experience with a focus on SAP programming doing conversions and interfaces.

I have picked up other minor skills, including SAP configuration, creating Unix scripts, doing analysis, creating design specs, testing and project management. I also did some HTML and JavaScript coding for a design phase. I had certification in Advanced Business Application Programming/4 track in 1995, and I hold a master's degree in MIS. Before I switched into IT, I was a certified public accountant.

— ON THE BENCH

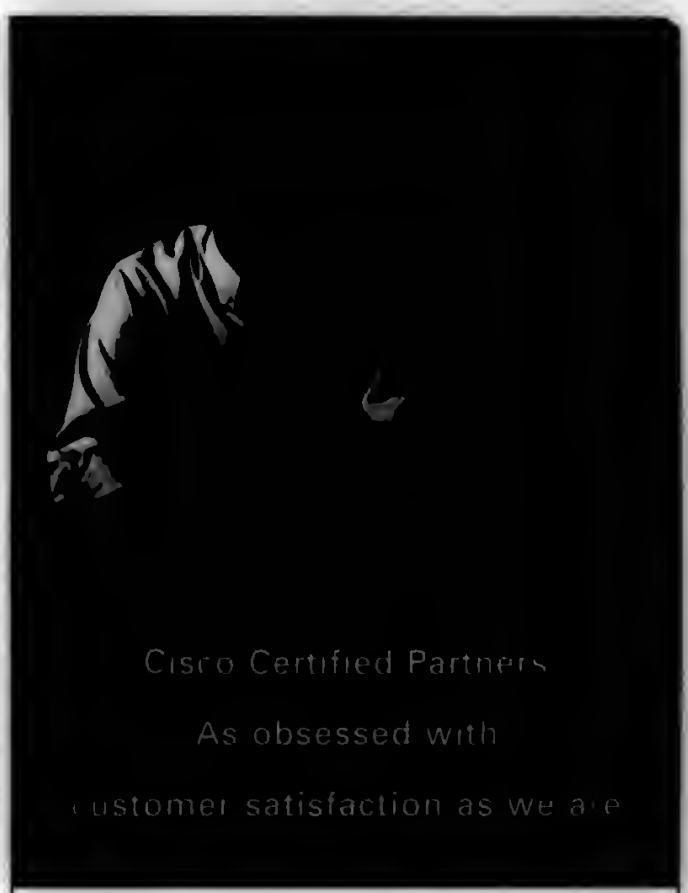
Dear Bench:

The problem isn't your SAP experience as much as the current state of mind in the city, says Joe Sabrin, president of eHire.com Inc. in New York. Some people are just now returning to work after the Sept. 11 terrorist attacks, and many projects are on hold.

Most current hiring has to do either with rebuilding hardware and network infrastructure or with reinforcing disaster recovery procedures.

After a time, $20 billion in federal funds will begin to flow into the region, notes Sabrin, and jobs will open up through primary contractors and subcontractors.

While you wait for jobs to open up in these areas, you might find that your CPA holds more immediate value than your SAP credentials, for the moment anyway.



Contact a Certified Partner.

CUSTOMER SATISFACTION

visit

cisco.com/go/certifiedpartner

Implementing new technologies and getting it done right the first time is now more critical than ever. Each Certified Partner focuses on customer satisfaction with the same tools Cisco uses to track satisfaction and pinpoint areas of improvement. To learn more or locate the partner right for you, visit cisco.com/go/certifiedpartner

Cisco Systems

Empowering the Internet Generation™

©2001 Cisco Systems, Inc. All rights reserved. Discover All That's Possible on the Internet and Empowering the Internet Generation are service marks, and Cisco, Cisco Systems and the Cisco Systems logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries. The use of the word "partner" does not imply a partnership relationship between Cisco and any other company.



SO RELIABLE, IT'S THE LEADING DATABASE IN HEALTHCARE

More hospitals around the world are running their "life-or-death" applications on Caché than on any other database system. With proven reliability like this, you should consider Caché for *your* critical applications.

With its lightning speed and massive scalability, the performance of Caché makes it a perfect match for any enterprise, *in any industry*, with a requirement for fast transaction-processing applications capable of scaling to tens of thousands of users.

Caché uniquely combines robust object and relational technologies, coupled to a multi-dimensional data engine. Plus, it includes a rapid Web application development environment.

Caché is backed by 24x7 support from InterSystems – a leader in high performance databases for 23 years, with 4,000,000 users* worldwide in healthcare, financial services and other industries.

InterSystems
CACHÉ
Make Applications Faster

Download Caché for free or request it on CD at www.InterSystems.com

* InterSystems' database technology is used by Ameritrade, Hitachi, Johns Hopkins, Kennedy Space Center, Paine Webber, Pepsi Cola, Prudential Insurance Co., Shell, U.S. Army, World Bank and other successful enterprises.

© 2001 InterSystems Corporation. All rights reserved. InterSystems Caché is a registered trademark of InterSystems Corporation. Other product names are trademarks of their respective vendors. 24-2

THIS WEEK



XP SECURITY

With the release of Windows XP, Microsoft may finally be getting serious about security. But are the changes enough? PAGE 50

BIG STEP FOR SIP

Microsoft has built support for the Sessioo Initiatioo Protocol into Windows XP. SIP has the potential to help users engage in cost-effective, real-time communicatioo over a variety of devices. PAGE 52

QUICKSTUDY

Knowledge management is the art of collecting organizational data and turning it into usable, accessible information. PAGE 56

SECURITY JOURNAL

The recent terrorist attacks prompt security manager Mathias Thurman to conduct an internal security review that turns up new concerns. PAGE 58

EMERGING COMPANIES

Infoteria's e-business tools support RosettaNet XML standards to ease supply chain transactions. The product has been well received, but its success depends on users' acceptance of RosettaNet. PAGE 60

NICHOLAS PETRELEY

The Cost of Free IIS

I KNOW IT HAS BEEN WEEKS, but I'm still reeling from the news. Earlier this month, Gartner Inc. strongly recommended "that enterprises hit by both Code Red and Nimda immediately investigate alternatives to IIS [Internet Information Server], including moving Web applications to Web server software from other vendors, such as iPlanet and Apache," (*www3.gartner.com/displaydocument?doc_cd=10103*).

Gartner has some fine people and produces some excellent data, but the outfit always struck me as one that looked at the world through Microsoft-colored glasses. Perhaps Gartner has finally seen the light. Or maybe this was payback for having bought into the success of Windows CE, Zero Administration Windows and the Net PC. Regardless, I was shocked.

Microsoft's official response could be paraphrased as "we're no worse than any of the alternatives." Normally, I would say this was an atypically anemic example of spin for Microsoft, but the quality of PR coming from the Redmond damage control squad has deteriorated dramatically over the past couple of years. I'm betting it's sleep deprivation from having their pagers beep oearly around the clock.

"They stink, too" is no excuse for providing a shoddy product, even if it were true. But it happens to he blatantly false. I doo't know about iPlanet, but Apache has had an excellent record compared with Microsoft IIS.

See for yourself. If you visit SecurityFocus and look np Apache Group in the security alerts, you'll get a list of the last 20 known vulnerabilities. You can cross off eight of these entries because the problems stem from the server-side scripting languages that you add to Apache, not Apache itself. These add-ons are also available for Windows and IIS, so one has to either add these to the list of IIS vulnerabilities or place the blame where it belongs — on the add-on package.

Of the remaining 12 vulnerabilities, one problem is specific to running Apache on Windows, and two more are confined to Apache on the Macintosh. Barring pure stupidity on the part of an administrator, only the Windows-specific vulnerability was particularly dangerous.

If you look at the list of Microsoft alerts oo the same site, only seven of the last 20 alerts are IIS-related. IIS has to compete for space with the security holes in other Microsoft products, such as Exchange, Proxy server and Windows itself.

The vulnerabilities in this list are more likely to lead to grave consequences, but it's not just the differences in severity that I find striking. It's the time it took to fill up 20 entries. The two bottom entries in the Apache list are dated September 1999. The two bottom entries in the Microsoft list are dated August 2001. Two months. Two years. You do the math.

If that isn't enough to get you to switch, then consider Microsoft's own reasoning. It claims that there are so many Windows-specific viruses, worms and Trojan horses not because Windows is so insecure, but because Windows has the largest market share.

According to the Netcraft Web survey (*www.netcraft.co.uk/survey*), Apache runs about 60% of Internet Web sites. About 28% are running a flavor of Microsoft IIS, which includes every Joe Blow with a cable modem running Windows 9x and the Microsoft Personal Web server. So, if the problem is market share and not bad software, theo why over a five-day period did my Web servers log 35,000 Nimda and Code Red probes that exploit IIS-specific weaknesses, but not a single probe related to Apache?

Microsoft fans will no doubt point out that although the Netcraft survey says that Linux is growing faster than Windows, it also says that in terms of actual machines running Web sites, 50% of them run Windows. Linux takes second place, with 30%. Malicious software probes IP addresses, not machines, so it's a stretch to say that this proves Microsoft's point.



NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at [redacted].

But eveo if one could win that argument, I'm not sure I'd trot out these figures in defense of IIS. Sooner or later, someone's going to wonder why it takes 50% of the machines on the Internet to run 28% of the Web sites. On the other hand, it does prove that Microsoft was right about one thing: the hidden costs of free software. Getting IIS free with Windows obviously doesn't mean it won't cost you in the long run. ▶

Windows XP:

The newest release of Windows offer
But some IT managers still have



"WHEN WINDOWS XP IS RELEASED, soon all hell will follow. New zombies and nanobots are waiting to exploit vulnerabilities. Be warned . . . " When an Australian hacker identified only as "Z" sent this e-mail message to *Computerworld* on Aug. 7, he was referring to a controversial paper claiming that hackers will exploit weaknesses in Microsoft Corp.'s new Windows XP operating system to turn PCs into an unwitting army of denial-of-service (DOS) attack zombies.

But closer inspection suggests otherwise, according to users and analysts. So far, those zombie bots in Z's rant are nowhere to be found.

Despite several potential vulnerabilities raised in the past few months by security analysts and privacy advocates, beta testers have been unable to find any serious security threats in Windows XP. To the contrary, "with Windows XP, Microsoft has at least fixed the sins of their past, which is more than I can say for other operating systems," says John Pescatore, senior security analyst at Gartner Inc. in Stamford, Conn.

Not only do analysts and beta testers generally praise Microsoft for repairing past security mistakes that riddled Windows 9x and NT machines, but they also feel that XP's new embedded security features, particularly the ability to set privileges and an embedded firewall, will go far in protecting novice users from themselves and one another. And, in the case of XP Professional, these same security features can be centrally configured to follow corporate security policies by groups and locations.

However, some IT professionals aren't convinced that Microsoft has committed to a more secure operating system. They cite possible vulnerabilities with raw sockets and the Remote Assistance feature, and privacy concerns over built-in support for the Passport personal information management service.

The Raw Deal

Last summer, Steve Gibson, president of Gibson Research Corp., a security and privacy software and Web publisher in Laguna Hills, Calif., published a paper (*http://grc.com/dos/winxp.htm*) accusing Microsoft of opening a new "back door" into Windows by building raw sockets support into XP.

"Raw sockets means raw access to the Internet. And the problem of malicious agents getting into people's computers and launching DOS attacks with spoofed packets goes up dramatically with use of raw sockets," he says.

Because they skirt traditional TCP/IP protocols, hackers can use raw sockets to generate TCP packets, and it's impossible for receiving networks to determine if those packets are legitimate. There's no way to block them, Gibson explains, because that would mean blocking all TCP packets. That would effectively drop all inbound traffic.

Raw sockets are nothing new. Various flavors of Unix and Linux run raw sockets, as does Windows 2000. "But all operating systems that offer raw sockets deliberately protect the access to those raw sockets by requiring the highest system privileges possible," Gibson says.

Windows XP, however, installs with full administrative permissions turned on, meaning that

novice users have access to kernel-level privileges, Gibsoo says.

True, says Mark Croft, lead product manager at Microsoft's Windows division. XP ships with full administrative privileges for application compatibility reasons. However, Croft and others say it would be hard to launch a DOS attack from an XP machine because the attacker is unlikely to get a malicious program onto the machine in the first place.

That's because XP ships with the embedded firewall, called Internet Connection Firewall, set at the highest security setting to deny executables. And the firewall hides tbe IP address of the machine. In addition, once XP is installed, users can drop administrative privileges by selecting the "limited account" feature in the Control Panel.

"The big problem with home users running high-bandwidth connections is that everyone can access the hard drive. But [the] WinXP firewall is designed to block people from accessing services running on the machine," says H.D. Moore, senior vulnerability research analyst at Digital Defense Inc., a security consultancy in San Antonio. "The firewall default setting is 'restrict everything,' which is impressive since users don't know that they should filter executables."

Moore is also impressed by XP's eliminatioo of default administrative passwords that wreaked havoc on Windows 9x and NT machines. If implemented correctly, XP's embedded features and password improvements will block the most common ways malicious code gains the control it needs to turn machines into zombies.

XP's firewall is in no way designed as an eoterprise tool. It's designed for home users with broadband connections who aren't aware of the need for a firewall, according to Microsoft. It also lacks outbound filtering capability, so if DOS zombie code does somebow get loaded onto an XP machine, an outbound DOS attack couldn't be stopped, says Ken Dunham, a computer consultant in Nampa, Idaho.

"Windows XP will lower the risk of infection against malware but fails miserably once malware penetrates a system," he says. "Trojans that manage to get past XP's new firewall will likely have a heyday exploiting outbound communications."

For additlooal protection, users should look for outbound filtering firewalls from vendors like Zooe Labs Inc. and Symantec Corp., both of which offer home and professional versions.

IT managers also voice concern about the system's new Remote Assistance feature, in which a user can invite a guest to log on to the machine for remote troubleshooting. The feature uses the same code as Microsoft's terminal server, for which there are 251 vulnerability and patch postings on the CERT Coordinatioo Center Web site.

"[Remote Assistance] would send chills down the spine of anybody interested in computer security," says Byron York, a computer security professional at a health insurance company in Michigan.

But there are several checks in Remote Assistance to protect users from themselves, according to Croft. It's the user who must first launch the Remote Assistance program by sending a trouble ticket (the user's encrypted IP address) via e-mail or instant message to the remote assistant. Tickets expire in 24 hours by default (Croft recommends shortening the expiration to an hour or less.). The assistant must then request permissioo to remotely control the user's machine. The oser can accept or decline the request and can terminate the session at any time.

"The user would have to be double dumb to get in trouble with remote assistance," Croft claims.

Microsoft has also receotly responded to privacy concerns over its Passport informatioo service. Now, the only feature in XP requiring the use of Passport is the instant messaging program, and it collects only an e-mail address and pass phrase, Croft says.

New Commitment?

No one can predict what new types of exploits might crop up in the months and years after XP ships. But for oow, Microsoft seems committed to a more secure cyberspace, say users and analysts. Nonetheless, Gartner's Pescatore questions whether Microsoft will remaio committed down the line or dump the security focus the next time a newer, sexier technology arises.

"I'm giving Microsoft a 50% chance that they're just as interested in better processing as they are in marketing," he says. "But it all hinges on whether or not they can change the Microsoft culture of putting all the power into the hands of the user."

The Keys to XP Security

Standard XP Security features:

Firewall: The Internet Connection Firewall provides basic packet filtering and custom settings for ActiveX controls and other executable files. The default setting is to deny all executables.

Remote protections:

- **Blank passwords:** Accounts with blank passwords can no longer be used for remote log-in.
- **Guest account:** All remote log-ins are forced into a guest account with customizable permissions. XP ships with the guest account enabled and the default permission of "severely restricted." (Guest log-on is turned off by default in XP Professional.)

Privacy: XP supports the Platform for Privacy Preferences (P3P) user privacy settings in the browser. It ships at the medium setting, which denies cookies that don't have a compact P3P-compliant header.

Wireless LANs: Supports 802.11b authentication and encryption.

Authentication challenge options: Supports smart cards and certificate authorities.

Security warning dialog boxes: These pop up when the user attempts to enable a risky function such as file sharing.

Additional features in XP Professional:

Group policy objects: Support for setting group security permissions and policy with templates for Basic, Compatible, Secure and Highly Secure environments.

Virtual private networks: Built-in IPSec-encrypted IP tunneling capability.

Network Monitor: Detects and troubleshoots network device problems.

Automated System Recovery: This system restoration option replaces the Emergency Repair Disk in Windows 2000 Professional.

– *Deborah Radcliff*

Quick Link: For a list of resources concerning Windows XP security, please visit the *Computerworld* Web site www.computerworld.com/s/723857

IS IT SAFE?

s substantial security enhancements.
e concerns. By Deborah Radcliff

A Window to REAL-TIME COMMUNICATION

Microsoft debuts support for Session Initiation Protocol in Windows XP. By Carol Sliwa

THE SESSION INITIATION PROTOCOL (SIP) may not be a familiar technology term to many corporate users. But that might change now that Microsoft Corp. has built support for the lightweight protocol into the Windows XP desktop operating system that it officially launches this week. In the coming months, more users may learn about SIP and find out if it lives up to its promise to bring more innovative and cost-effective real-time communications to their companies.

SIP, which became an Internet Engineering Task Force (IETF) standard in 1999, lets a user initiate any type of real-time communication session — such as text-based messaging, voice, video or even application-sharing — with another user over an Internet Protocol (IP) network. Extensions to SIP enable instant messaging.

Because SIP is lightweight, it can work not only with PCs but also with other devices, such as mobile phones or personal digital assistants. For instance, a PC user equipped with the right software could make a voice call to a colleague on a cell phone.

Vendors are already making SIP phones and proxy servers, but Microsoft's support is "an important milestone in terms of SIP gaining momentum," says Peter O'Kelly, an analyst at Patricia Seybold Group Inc. in Boston.

Microsoft is so bullish on SIP that it's putting a SIP stack and application programming interface into its entire Windows family, including XP for PCs and embedded devices, CE for the Pocket PC and the Windows .Net Server operating system, says Mark Lee, a lead project manager with the company's Windows team.

In June, Microsoft held a Windows design review event that drew approximately 90 companies to learn about implementing SIP. Microsoft also plans to support Internet-based services that an individual or a company can use for SIP-based messaging: authentication through its .Net Passport service and presence and notification through its .Net Messenger service. But corporations may elect to use their own servers to authenticate users, maintain the "presence" information about when and where users are available, and enable notification between clients, Lee says.

Reuters Group PLC took the latter approach, working with Microsoft on a SIP-based instant messaging system for the financial community. The London-based news and financial information provider got the idea from the instant messaging services that are popular among consumers and corporate users.

"We thought, 'Boy, could that play a role in the financial market,' " says Lewis Knopf, managing director of collaboration services at Reuters. But, Knopf says, his company recognized that existing instant messaging services were too insecure and unreliable and didn't provide the logging mechanisms that financial firms need.

So, working with Microsoft, Reuters approached 25 financial institutions, including Citigroup Inc., Deutsche Bank AG and Morgan Stanley Dean Witter & Co., about creating a high-security, SIP-based instant messaging service and contacts directory. Because Windows XP has yet to gain mainstream usage, Reuters must distribute to its partners SIP-enabled clients that will run on various Windows versions.

On the back end, Reuters is using a SIP-enabled real-time communications server from Microsoft, which has yet to announce the server software, to establish sessions between clients, manage communications and track presence information, Knopf says.

How SIP Works

The Session Initiation Protocol (SIP) lets one user initiate any type of real-time communication session – such as text-based messaging, voice, video or even application-sharing – with another user over an IP network. Here's an example of how a typical corporate scenario might work:

Alice, who works at Company A, needs to speak with Bob, who works at Company B. Each company has a SIP proxy server, and Alice and Bob can be using any of a variety of clients, including a PC software phone, or softphone; a SIP hardware phone; an analog phone with an adapter; or a SIP-enabled cell phone.

1. When Bob turns on his client, his phone automatically sends a register message to his company's SIP proxy server. The register message tells the SIP proxy server: If you get a call for Bob, send it to this IP address.

2. Alice decides to call Bob via her PC softphone. She types, "I want to call Bob at Company B." Her invite request is sent to Company A's SIP proxy server.

3. Company A's SIP proxy server uses the Domain Name System to look up Bob's domain, and the invite request is forwarded to Company B's SIP proxy server.

4. The Company B SIP proxy server sees that Alice wants to call Bob and forwards her invite request to Bob's IP address, which it obtained from the registration process.

5. Bob's phone rings, or a screen pops up, and Bob is asked if he wants to accept the call. His affirmative response, called a 200 OK, is sent to his company's proxy server.

6. The Company B SIP proxy server forwards the 200 OK to Company A's SIP proxy server, which sends the 200 OK to Alice's client.

7. An acknowledgment message, or ACK, is sent directly to Bob's client. Alice and Bob begin communicating.

Note: If either party used an ordinary telephone, a voice-over-IP gateway would be needed between the SIP proxy server and the client device for the connections to be made.

SOURCE: JONATHAN ROSENBERG, CHIEF SCIENTIST AT DYNAMICSOFT INC., CO-AUTHOR OF THE SIP SPECIFICATION AND FORMER CO-CHAIRMAN OF THE IETF'S SIP WORKING GROUP

Each partner also must have a SIP proxy server to enable messages and logging.

Reuters plans to launch the service with its 25 partners by year's end and make the service available to the rest of the financial industry early next year. Knopf notes that some partners and client companies may elect to host their own instant messaging systems and connect to Reuters' hosted service in federated fashion.

Right now, the firms are piloting text messages, but audio and video may be added in the future, Knopf says. "Our main worry is bandwidth," he says.

The potential for SIP is just starting to be explored. Cambridge, Mass.-based Lotus Software Group and Dulles, Va.-based America Online Inc. recently tested an extension to SIP — SIP for Instant Messaging and Presence Leveraging Extension — to get their proprietary instant messaging services to interoperate on a server-to-server basis.

Some companies are experimenting with replacing private branch exchange telephone systems with a single network that carries both data and voice traffic. For example, telecommunications software developer Webley Systems Inc. in Deerfield, Ill., and voice application network provider Tellme Networks Inc. in Mountain View, Calif., are in the process of equipping internal users with SIP phones.

SIP phones, which can be hardware or software, are configured with SIP proxy addresses. A user says the name of the individual he wants to call, and the request is sent to a voice-activated dialing application and then to a SIP proxy server, which routes the call to a voice-over-IP gateway, if necessary, and then to the intended recipient — even if the recipient is using an ordinary telephone connected to the public switched telephone network.

"A lot of companies are finding that maintaining a data network and voice network is a very expensive proposition," says Don Jackson, vice president of advanced telephony at Tellme Networks. "If you're already going to put in a data network for the PCs on everyone's desktops, why not make the network do double duty and provide voice access as well?"

Since new SIP proxy servers can register a number of devices for any end user, users have the advantage of being able to indicate their preferred choices for incoming calls at any point in time, if they have several device options.

"It's much easier to integrate new applications into these SIP-based networks because they're software-based and the protocol is open," Jackson explains.

Quick Link For access to this article online, additional resources and related links, please visit the *Computerworld* Web site. www.computerworld.com/q?alt20

New Technology, Features Supported in Windows XP

Some of the new features and technology that are expected to impact corporate users in Microsoft's new Windows XP desktop operating system:

NEW FEATURE/ TECHNOLOGY	WHAT IT DOES	HOW IT WORKS	BOTTOM LINE
Application compatibility	Allows applications built for older Windows operating systems to run on Windows XP.	Operating system catches every application programming interface call and monitors what happens when an application tries to start up. A Program Compatibility Wizard has a set of fixes, or shims, that provide an application with the code that it needs to run. Corporations get an application-compatibility tool kit to test applications.	Corporations should have less trouble getting their legacy applications to run on Windows XP than they did on Windows 2000. Microsoft claims that 12,000 commercial applications will run well on Windows XP, compared with approximately 6,000 for Windows 2000.
Remote Desktop/ Remote Assistance	Remote Desktop lets employees access their primary office desktops from the road. Remote Assistance lets IT staffers see and take control of the screens of mobile users they're trying to help.	Through the Remote Desktop Protocol, a Windows-based terminal or other Windows-based client communicates with a Windows-based Terminal Server, which a corporation must have installed to enable this feature to work.	Corporations potentially can reduce costs associated with assisting remote users. Users could gain more flexibility to work from remote locations.
Improvements to System Restore	An administrator can pick a date on the calendar and restore a system to the way it was on that date.	Operating system actively monitors system file changes and some application file changes to record or store versions created before the changes occurred.	In the event of a problem, an administrator can restore an unlimited number of PCs to a previous state without losing personal data files, such as Word documents, graphics or e-mail. Windows Millennium Edition supported System Restore, but the operating system suffered a noticeable hit on performance when the feature was in use, said Microsoft product manager Tom Laemmel.
Enhanced support for wireless networking (802.1x)	A "seamless roaming" feature automatically authenticates users to another wireless network when they change locations. A "zero configuration" feature allows wireless users to gain access to other wireless networks they're permitted to use.	Operating system detects when a user moves to a new wireless network access point and forces reauthentication to ensure appropriate network access. As users roam from one wireless network area to another, the operating system automatically configures itself to the nearest network.	Users should find it much easier to stay connected when they're working in a wireless state. This feature will eliminate the need to write code to enable users to switch from one network to another. All they'll see is a sign-on screen.

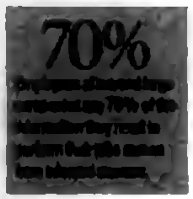
SOURCE: MICROSOFT CORP.

Symbiotic Intelligence

Networks are enabling informal groups of people to replace experts. By Gary H. Anthes

THE INTERNET, so relentlessly hyped in the late 1990s, may actually be doing more to boost U.S. productivity than most people have imagined. Its unique ability to foster human interaction may prove to be a hidden catalyst for solving some of society's toughest problems.

Scientists have viewed evolution as a process of natural selection resulting from competition. But recently, some have argued that cooperation and symbiosis are really the dominant forces in nature.



An academic argument of no practical importance? No, says Norman Johnson, a computational physicist at the Los Alamos National Laboratory in New Mexico. Johnson, who leads the Symbiotic Intelligence Project at the lab, says an emerging understanding of how people interact in informal groups to solve complex problems may profoundly influence how we organize and manage corporations, how we hire and train people and what technology we equip them with.

Johnson argues that self-organizing groups of "average" people can solve complex problems better than experts can. Challenges today — such as managing a global economy, fighting terrorism or optimizing supply chain operations — are more complex and more distributed than problems were 20 years ago, and so they are less amenable to top-down solutions by "experts," he says.

In a U.S. Department of Labor survey, employees at several large companies said that 70% of the information they need to perform their jobs comes from informal sources, not from training courses, manuals or instructions from their bosses. Computer networks, acting in symbiosis with groups of people, facilitate the flow of this informal information and help create knowledge, Johnson contends.

"The big 'Aha!' for the Internet is that it has become all about a social process," Johnson says. "Every major technological success in the public in the last 50 years — cars, phones, beepers, cell phones, Internet — has been about social connection. They all enhance our ability to connect in some way and are successful because they contribute to the symbiotic intelligence process. But because we do not view society as a self-organizing entity, we only see the advantages to the individual, not the whole."

Johnson says U.S. intelligence agencies invested heavily in IT in the 1990s, believing that tools such as data mining were the key to solving complex intelligence problems.

"But it was generally a failure," he says. "They were always surprised by events, when in hindsight, the danger and players were clear.

"What the intelligence community forgot — possibly even to this day — was that humans are the best processors of complex information," he says. "Only the combination of a human/computer symbiotic system can solve large problems of high complexity."

Johnson says the U.S. shot forward economically during the 1990s while Japan stagnated because the U.S. has a much higher implementation of IT. The worker productivity increases that have driven the U.S. economy can't be easily explained by academics and economists because traditional models see the world as a top-down-driven place operating on known rules. The Internet provides a hidden but vital mechanism that the models overlook, Johnson says.

Managers can stimulate the creation of symbiotic intelligence by becoming enablers more than decision-makers, he adds. They can do so by encouraging the use of the Internet, especially e-mail; by flattening the organization while relying less on formal training and expert advice; and by encouraging expression and risk-taking. Managers also should define groups of people with highly diverse personalities and experiences, because diversity accelerates the creation of symbiotic intelligence, he says.

Adele Howe, a computer science professor at Colorado State University in Fort Collins, says Johnson's ideas have practical implications in numerous realms. For example, she says, the best solutions to complex problems in computer science — such as sorting or scheduling — are usually a hybrid of algorithms cobbled together from various sources, not a monolithic approach dreamed up by a single expert.

"The lesson for IT managers is to invite diversity," Howe says, which means taking chances on job applicants with nonstandard credentials. She also advises managers to provide work environments that promote informal interaction.

"With the increased use of the Net, many of the problems that have challenged traditional forms of management and organizations may now find solutions," Johnson says. "The importance of this alternative will become more significant as the complexity of our world increases and our traditional ways of solving problems fail."





Store Smarter.

active archive

Introducing Active Archive Solutions: The intelligent way to optimize database performance.

Over the next decade, mission-critical databases are expected to grow by more than 40% every year. How will you keep applications running at peak performance without endless hardware upgrades? Active Archive Solutions dramatically reduce the size of your database by setting aside infrequently used data. However, the data is always kept "active" for easy access. You improve performance and availability without having to squeeze your database or your budget. Learn more.

Call 800.457.7060 or visit **www.storesmarter.com.**

princeton softech

© 2001 Princeton Softech Inc. All rights reserved.

Knowledge Management

DEFINITION

Knowledge management is the art or science of collecting organizational data and, by recognizing and understanding relationships and patterns, turning it into usable, accessible information and valuable knowledge.

BY PETE LOSHIN

RATHER THAN WAX philosophical about what knowledge is, let's let it be any information that can further an organization's goals. If managing IT can be compared to herding cats, managing knowledge is comparable to ranching fleas on a cat herd.

The knowledge management model implies that those organizations best able to collect, index, store and analyze knowledge have an advantage over their competitors. To differentiate between information and knowledge, consider what happens when you interpret data logs. Looking only at the logs, a twice-daily drop in bandwidth usage at a particular office may be quite mysterious; only by checking in with on-site managers can you discover that those lulls mark the arrival of the office coffee cart.

These mysteries crop up with every new hire or responsibility change, wasting valuable time solving the same problem over and over. With knowledge management, systems are put in place to collect the answers and make them more accessible. This approach can be used anywhere in an organization but most often makes sense in customer support applications. Applications can include compiling solutions to MIS problems, offering human resources support for employees and providing self-service support for retail customers in many industries.

Though it's more a business model than a technology, knowledge management incorporates new technologies as they appear. Organizations networking their PCs in the late 1980s and early 1990s enabled more employees both to use and contribute to early knowledge management systems. These systems depended on centralized databases in which employees entered information about their jobs and from which other employees could seek answers.

Knowledge management systems have always relied on data management technologies such as relational database management systems, data warehousing and data cleansing. To track and analyze how knowledge management systems are being used, managers turn to the reporting utilities in their database systems. Such reporting tools also help generate knowledge for the organization and manage existing knowledge assets.

Practitioners of knowledge management have been quick to adopt advances in groupware tools, too. Distinguishing between knowledge management and groupware can be difficult: Knowledge management systems often rely on groupware technologies such as Lotus Notes, and, by definition, groupware facilitates the exchange of organizational information. One telling difference is a knowledge management system's emphasis on identifying knowledge sources, knowledge analysis and managing the flow of knowledge within an organization — all the while providing access to knowledge stores. The knowledge management model regards the sum of all knowledge within the organization as its "intellectual assets," and provides tools for managing those assets.

As a management tool, knowledge management systems require technology as well as consultants who advise on how to handle knowledge audits, analysis and flow. And knowledge management consultants are quick to apply new technologies. Over the past few years, just as groupware applications shifted from proprietary client/server models to a platform-agnostic Web model, knowledge management's embrace of Web technologies has extended its usefulness and cut costs. Web-based knowledge management systems require no (or minimal) change to users' desktops and can be simpler to install and administer.

More recently, knowledge management systems started using XML to identify relevant data elements and extract knowledge from them both in and out of the organization. XML offers document schemas and tags, allowing readers to collect meta-information about each piece of information. For example, a data object marked "<Solution>" in a help desk application is more likely to have useful answers than one marked "<Problem>."

Do You Know What You Know?

- A collection of data isn't information.
- A collection of information isn't knowledge.
- A collection of knowledge isn't wisdom.
- A collection of wisdom isn't truth.

— Neil Fleming, Lincoln University, Canterbury, New Zealand

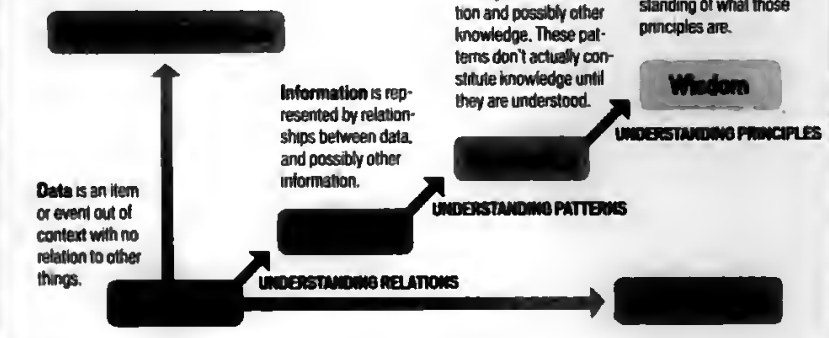
Is It for You?

Knowledge management requires buy-in at the very highest levels of an organization. Costs can be quite high, as off-the-shelf products are unlikely to solve the typically massive and complex challenges facing large organizations. And knowledge management systems are rarely useful outside of large organizations. As a result, high costs for software and hardware may be dwarfed by consulting fees for customizing knowledge management software or creating customized in-house applications.

Ultimately, whether you build or buy, creating a knowledge management system represents a significant management decision — one that must have support throughout the organization.

Loshin is a freelance writer in Arlington, Mass.

Clarifying Terms



ADAPTED FROM KNOWLEDGE MANAGEMENT, BY GENE BELLINGER OF SEATTLE BASED CONSULTANCY OUTSIGHTS INC. (WWW.OUTSIGHTS.COM/SYSTEMS/WELCOME.HTM)

Quick Link: For a complete list of Technology QuickStudies, visit Computerworld.com at www.computerworld.com/q?s3000

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*


CONSOLIDATION IS AN
disaster recovery
disaster recovery at lellogicstorage.com.
LOGIC

Terrorist Worries Force Top-Down Security Review

In light of recent events, Mathias begins to conduct an internal security review — and turns up new issues

SINCE THE TRAGEDY on Sept. 11, I've thought about what I can do to prepare this company in the event that another terrorist act occurs and we are somehow victimized. I've also thought about what I can do to prevent a terrorist act from occurring at my company or having our infrastructure used in some way by terrorists.

No doubt computers and the Internet were used in some way in the perpetration of this horrific crime. Whether it was encrypted e-mail, digital steganography, newsgroups, chat sessions or instant messaging programs, all of these technologies allow for covert communications.



SECURITY MANAGER'S JOURNAL

I can't control what's available on the Internet, but I will do everything I can to prevent cyberterrorists from exploiting my company's information systems to attack my firm or my country. I don't want to be the security manager who let his company's systems be used as a vehicle to transmit messages or store information to facilitate a terrorist attack. Fortunately, there are some things I can do. We already have many of the information security controls in place, but I'm reviewing them to make sure we're doing the most we possibly can.

Back to Basics

I've started by reviewing account creation, administrative access and other types of permissions that might allow for unauthorized access. On any given day, our employees use about 150 administrative accounts to access our information systems. Before a person is granted administrative rights, the request goes through a thorough review process. As a member of the review team, I regularly question requests for access if I feel the need isn't justified. When conducting such a review, I also check that accounts of employees who have left the company have been properly deleted or disabled, according to our employee-departure policy.

We use a variety of tools to restrict the amount of administrative access afforded to individuals. Only certain employees have full privileges. For all other administrative accounts, only the functions required for an individual's job are granted. To accomplish this, we use a combination of strong user and group profiles for Windows NT and the free Sudo utility for Unix. We're also in the process of implementing Bedford, Mass.-based RSA Security Inc.'s SecurID token-based infrastructure for administrative access.

There are three forms of authentication: Something you know (such as a password), something you have (an automated teller machine card, for instance) and something that you are (such as your fingerprint). The SecurID token gives us a two-form factor authentication mechanism, requiring a token and a passcode, for example.

Then there's the issue of physical access. Many companies, including my own, separate information security from physical security, but an information security manager had better be aware of his company's physical access. The best firewall in the world won't do any good if someone is able to walk up to a Unix system with a laptop, plug into the serial port and boot the system from a local floppy disk. Physical access control, proper hiring practices and the physical security of the workplace are important.

I have, with minimal notice to management, tried to gain unauthorized access to our building, other offices and data centers. I've been able to roam around the offices of departments such as payroll, operations and even the executive staff looking for unsecured areas, passwords under keyboards and unprotected screen savers. As a result of my findings, I'm modifying our current policies to address the technical issues, such as forcing automatic screensaver activatioo as part of our workstatioo baseline. I have also spoken to our security service regarding my ability to eoter the building unchallenged on the weekend.

Security Planning

I'm also considering writing up a false résumé to test our hiring practices. Hackers have tried to assess internal security in targeted companies by getting an interview for an information security job. I remember a story from a few years back when an individual was hired into a telephone company and installed back doors into the private branch exchange switches so he could make free long-distance calls. Without the proper checks, you don't know who you're hiring.

And when was the last time you went dumpster diving? Some companies can't afford a document destructioo service. Instead, they dispose of sensitive data on their way out the door each evening by throwing things into a dumpster. Io one instance at a previous employer, I collected a virtual private network (VPN) setup document complete with the key passphrases and user passwords I needed to set up the VPN tunnel. I even found a Web address to download the VPN software client.

I also plan to review our disaster preparedness and business-continuity plans. Information systems at Wall Street firms are about as well prepared as they can be. Unfortunately, many companies are far from Wall Street's baselines and methodologies. Whether it's money, technology or awareness, companies always seem to have excuses for not addressing business-continuity planning or disaster recovery.

Of my four previous employers, not one had invested in developing a sound business contiouity plan. Each time I tried to build a business-continuity program, I was able to justify and acquire funds only for backup systems and offaite data storage. Many companies seem willing to take the risk that the low chance of catastrophe outweighs the cost of resources needed to arrange for an alternate site to fail-over to in the event of a disaster.

Sure, it's expensive. And perhaps some companies can justify the risk of not investing in the needed infrastructure. However, it's important that, as a security manager, I present the business case to managemeot and ensure that the effect of a loss of infrastructure is put in proper perspective.

How can we, as security managers, improve information security in light of recent events? I welcome your experiences and suggestions in the Security Manager's Journal forum. ◗

Quick Link: For more on the Security Manager's Journal, including past journals, visit: www.computerworld.com/q?q2000

THISWEEK'SGLOSSARY

Digital steganography: This is the art of hiding documents, such as word processing files, spreadsheets or maps, inside other files. Practitioners commonly use graphics files to hide the information, but the technique will work with almost any file type. Once created, the documents inside such files are virtually impossible to detect.

LINKS:

www.courtesan.com/sudo: With this free software utility for Unix, written by Todd Miller, an administrator can give users or a group permission to run specified commands with root privileges.

www.bioscrypt.com/00/bio-00.shtml: One way to improve security is by restricting data center access with fingerprint readers or other biometric devices. Toronto-based Bioscrypt Inc.'s Web site shows a range of devices you can use and includes white papers on the subject.

www.sans.org/infosecFAQ/covert channels/steganography.htm: The Web site for the Bethesda, Md.-based SANS Institute gives an excellent overview of steganography. The story also includes an extensive bibliography of related online links and books.

■ This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mthurman@hushmail.com or go to the Security Manager's Journal forum.

INTEGRATION:

A HERCULEAN TASK.



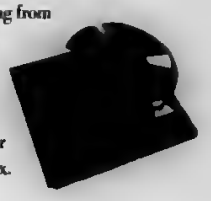
Reshaping IT infrastructures can be difficult for mere mortals.

How's this for a challenge? Take an e-business infrastructure teeming with disparate networks, platforms, standards and applications, and make them all work as one. Across all business units. With suppliers, partners and customers. Yep, integration is one colossal test of strength.

So how do you tackle it? You can start by ordering our Software Evaluation Kit for Linux.® (It's yours free by simply registering by phone or online.) In it you'll find an overview of e-business integration, along with perspectives and strategies for tough integration challenges. You'll also get free trial code for IBM software such as DB2,® WebSphere,® Lotus® and Java™ Tools. It's the perfect integration software primer. And best of all, everything in it also speaks Linux.

As the fastest growing and most accessible operating system, Linux is an ideal platform for the integrated environment. For small business or corporate behemoth. It's open, scalable and hardware-agnostic.

That's why IBM offers the industry's richest selection of code for Linux. And then backs it with IBM service, support and consulting. That means an army of integration experts proficient in everything from designing to deploying to maintaining truly open and interoperable systems.



To see how you can take on an integration project, with little to no chance of a hernia, visit our Web site or call today for your free Software Evaluation Kit for Linux.

CLICK OR CALL FOR A FREE IBM SOFTWARE EVALUATION KIT FOR LINUX.

Go ibm.com/e-business/sgreadyp4 | 1 800 426 7080.

IBM.

LEGAL NOTE IBM, Lotus, the e-business logo and other marks designated ® or ™ are trademarks of International Business Machines Corporation in the United States and/or other countries. Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both. Other company product and service names may be trademarks or service marks of others. Linux is a registered trademark of Linus Torvalds. © 2001 IBM Corporation. All rights reserved. Limit one kit per respondent. Respondents will be required to complete a registration form in order to participate in this offer. Offer ends 12.31.01. Offer available only in U.S.

Start-up Bets Big on Supply Chain Standard

Infoteria's software builds on RosettaNet for electronic supplier/customer exchanges

BY AMY HELEN JOHNSON

When a major customer requested that Ohka America Inc. support e-business transactions, the Hillsboro, Ore.-based company went searching last July for a vendor to help it automate. Using iConnector from Beverly, Mass.-based Infoteria Corp., Ohka successfully tested an electronic data exchange based on RosettaNet's XML standards.

"We were able to prove the concept that this would work very quickly and very cost-effectively," says Christopher Rosenthal, Ohka's RosettaNet project manager. As a result, the customer, Intel Corp., saw that Ohka, a producer of specialty chemicals for semiconductor manufacturers, was serious about complying with its request. And that raised Ohka's status with the chip maker, Rosenthal says.

Situations where a company needs an easy way to adopt Santa Ana, Calif.-based RosettaNet's standard for e-business transactions are a perfect fit for Infoteria, says CEO Tim Browne. The start-up is "100% focused on automating supply chains," he says. Infoteria has picked RosettaNet's XML-based Partner Interface Processes (PIP) and dictionaries as the standards most likely to be adopted for e-business.

Infoteria's focus on RosettaNet standards is a competitive advantage among a certain segment of customers, says Deborah Hess, a senior analyst at Gartner Inc. in Stamford, Conn. "For anyone specifically targeted on RosettaNet, this is probably the server they would want to have," she says.

Initially, Infnteria nffered a set nf independent, but interlocking, XML processing and management tools, such as iConnector. Last month, Infoteria released Asteria Server and Asteria Planet, which incorporate those tools intn systems that are quick tn implement, cost-effective and low-maintenance, claims Browne. Infoteria nffers Asteria Server to large enterprises that want tn build trading hubs.

Asteria Planet is a plug-and-play system for small and medium-size companies that trade with large companies.

Ohka is now upgrading tn Asteria, which supports trading with up tn five partners, according tn Rosenthal. Right now, iConnector packages sales order data retrieved from the company's enterprise resource planning system, encrypts it and passes it over the Internet to Intel's proprietary document exchange system, he says. Ohka has an Asteria Planet server in place and is waiting for RosettaNet to validate the invoicing PIP that Ohka plans to use, says Rosenthal.

Because Ohka is still in the implementation phase nf its project, Rosenthal can't yet calculate the financial benefits nf using Asteria. However, he says he expects that a shrinking payment cycle and reduced invoice errors will produce savings. Rosenthal also sees a security benefit in using Asteria compared with an application service provider-based service, since Ohka can control the server and the data behind its nwn firewall. So far, the implementation has been fairly smooth, he says.



INFOTERIA CEO TIM BROWNE says, "We banked the success of the company on RosettaNet."

Risk Factors

Infnteria's biggest weakness at this point isn't in the product suite, but in the company itself, says Hess. Established in Japan, Infoteria has lnw name recognition in the U.S. and is up against well-knnwn competitors, she says.

There's also a risk due to Infoteria's heavy reliance on RosettaNet, she says. The small and midsize companies that are the target market of Asteria Planet may not embrace RosettaNet as enthusiastically or as quickly as Browne hopes. Supporting other protocols is a good idea, Hess says.

Browne says Infnteria is branching out beyond RosettaNet. The company has built Asteria so that it can accept many different XML-based frameworks, he says, adding that Infoteria has produced versions that adhere to the ebXML business standard and the newsML content standard. ▶

Johnson is a Computerworld contributing writer in Seattle.

Infoteria Corp.

900 Cummings Center
Suite 403T
Beverly, Mass. 01915
(978) 922-4028

Web: *www.infoteria.com*

The technology: Supply chain trading server software based on the RosettaNet XML standard

Company officers:
- Tim Browne, president and CEO, U.S., and co-founder
- Pina Hirano, president and CEO, Japan, and co-founder
- Yoshiyuki Kitahara, executive vice president, chief technology officer and co-founder

Milestones:
- September 1998: Company founded
- January 1999: IPex shipped
- September 2001: Asteria released

Employees: 50

Burn money: $27 million from Nippon Technology Venture Partners Ltd., Softbank Venture Capital, Nippon Investment & Finance Co. and others

Products/pricing: Asteria Enterprise Server starts at $200,000, Asteria Planet at $20,000, iConnector (data extraction) at $5,000, DXSLT (XML style sheet processor) at $5,000 and IPex (XML development tool kit) at $5,000

Customers: Pioneer Corp., Siemens AG, Ohka America Inc., Nortel Networks Corp. and others

Red flags for IT:
- Infoteria's expertise is in RosettaNet XML standards.
- Some competitors offer a wider range of products and services.

COMPUTERWORLD emerging companies

[the buzz] STATE OF THE MARKET

Banking on RosettaNet

CEO Tim Browne makes no bones about it: Infoteria's success depends on enterprises adopting RosettaNet's standards for e-business. "In some ways, we banked the success of the company on RosettaNet," he says.

That's not such a bad bet, says Gartner's Deborah Hess. RosettaNet – a nonprofit consortium of 400 companies concentrated in the electronics, semiconductor manufacturing and IT industries – has a good chance of building the most widely used XML-based standards for data exchange and business-process alignment among trading partners and supply chains, she says.

RosettaNet's standards are the most mature of the specifications available, she adds. And, despite its roots in a narrow set of computer-focused industries, RosettaNet has opened up its standardization process to produce XML vocabularies for a wide range of markets.

However, Infoteria isn't well-known and is often eclipsed by companies like WebMethods and Tibco, says Hess. Other RosettaNet members also have products that perform similar, albeit broader, integration tasks.

WebMethods Inc.

Fairfax, Va.
www.webmethods.com

WebMethods' XML integration platform doesn't have the same laser focus on RosettaNet as Infoteria, says Hess. It requires customization to support RosettaNet's standards. WebMethods tends to do the implementation for companies, she observes, rather than providing a do-it-yourself solution as Infotena does.

Tibco Software Inc.

Palo Alto, Calif.
www.tibco.com

Tibco isn't as close a competitor to Infotena as WebMethods because it offers a much larger product line, says Hess. Tibco covers not only XML integration platforms, but also application servers, XML document extensibility tools, wireless portals and other areas. Enterprises may prefer to use Tibco when they need a wider range of applications than Infotena can offer, she says.

– Amy Helen Johnson



MAKE YOUR OLD JOB JEALOUS.

Few companies see the full scope of the contribution IT can make to their business. Fireman's Fund, a leading insurance company, will actively empower you to make that difference. Our Shared Services infrastructure positions you to make decisions with a tangible impact on the profitability of technological solutions. We'll give you the accountability you crave and inspire you to make the most of it – with lucid guiding principles, energized co-workers, and exceptional rewards. With your commitment, and that of our global parent, Allianz AG, there's nothing we can't accomplish.

Lead Systems Engineer

www.firemansfund.com/careers/ita5.html

The Lead Systems Engineer at Fireman's Fund will act as the team lead on a highly visible claims integration solution application which is responsible for providing the adjuster a "dashboard" view of the claim, their work in progress, and varied integration requirements, based on the vendor providing the service. This teamlead will; participate in the design of the application, the interface with the backend integration protocols; work closely with systems engineers, as well as a diverse user population; lead the application team and the legacy migration team; and provide feedback to the associated user-based design team. Must have full technical knowledge of systems analysis and application programming. Minimum 5 years development experience including Java, Websphere, OO principals, J2EE, MQ, XML, Messaging protocols, HTTP, HTML, and Cobol is required along with at least one project acting as team or technical lead. Please visit www.firemansfunds.com/careers/ita5.html for more information on our current opportunity in Novato, CA.

Employees enjoy innovative benefits including professional development opportunities, paid leave accounts, a matching 401(k) program and retirement benefits. Fireman's Fund is an Equal Opportunity Employer. M/F/D/V

Fireman's Fund®

Advertising Supplement



IT Careers in Software Development

The U.S. Department of Commerce anticipates that close to 200,000 software development jobs will be created during the next five years, not including retirements. Better than 60 percent of that total will be created in the non-IT sector – companies using software and IT as a business enabler vs. the product itself.

InterDigital Communications Corp., which has three development labs in North America (Montreal, New York and Philadelphia), is among those racing to the next generation. Founded 30 years ago in Philadelphia, **InterDigital** is in continuous search mode for three types of talent – software engineering/development, core wireless technology development (the ability to write basic algorithms defining how wireless appliances send and receive signals), and embedding software into chip design.

"One of the primary things that motivates our engineering team is that we are breaking new ground for mobile products," explains Gary Isaacs, vice president of human resources. With just under 300 engineers, **InterDigital** also attracts engineers with its small size. "Your focus may be on software, but at **InterDigital** you'll follow that software through all phases of the product life cycle, working side by side with the others whose work complements your own," says Isaacs.

"We look for people who contribute individually but also work on teams internally and with our partners," he adds. In addition to offering competitive compensation, **InterDigital** is currently rolling out a new career development tool for the engineering community that allows individuals to choose one of three career tracks: program-management, project leadership or technological expertise.

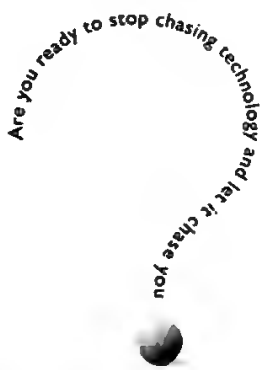
Similar in size is **CrossWorlds Software, Inc.**, based in Burlingame, CA. **CrossWorlds** provides business integration solutions that make integrating within an enterprise and across the Internet possible. Some of **CrossWorlds'** customers include Catarpillar, The Dow Chamical Company, DuPont, Nortel Networks, Sony, Talakom Austria and Whirlpool Corporation.

"Individuals who join **CrossWorlds** start off on a product team," says Robin Rea, employment managar. "We move people through a range of assignments with new responsibilities so that they can continue to develop. We tend to look at resumes for what you can bring to the company – advancement consistency, longevity in employment, experiance."

Rea says that the company of 350 employees is also a popular employer. "We encourage people to excel, we offer a wide range of projects, and we set standards high," says Rea. "And, the people who work around you are excellent at what they do. We value the attempt at excellence as much as the success."

For more job opportunities with software development firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net
- Produced by Carole R. Hudson
- Designed by Aldebaran Graphic Solutions



If you're an IT professional who's tired of playing industry catch up and want to get ahead of the game, look to Ajilon. As a frontrunner of information technology services, our people are always in demand. Our clients span a wide variety of industries so you'll benefit from a challenging, varied environment. And with a steady flow of new projects you'll have the stability that many consultants dream of. At Ajilon we don't just invest in technology, we invest in people. Visit us on the web at www.ajilon.com. You'll see we're taking information technology into the future. And we'd like to take you with us.

AJILON. | www.ajilon.com

The human side of information technology.

An equal opportunity employer.

United Nations Joint Staff Pension Fund Investment Management Service

SENIOR SYSTEMS ANALYST, P-5, NEW YORK

The United Nations is seeking to recruit a Senior Systems Analyst for the Investment Management Service of the United Nations Joint Staff Pension Fund. Under the supervision of the Director of the Investment Management Service, the incumbent is responsible for defining the design, strategic structure and analysis of current and future information technology requirements of the Investment Management Service (IMS), which is responsible for management of the investment of a $25 billion Fund. He or she will plan and oversee the Intranet/Internet and related technologies of IMS with particular emphasis on industry developments in the areas of real-time financial and market data, portfolio analysis and modelling. The incumbent will supervise the IMS infrastructure management (LAN, computer operations, facilities management), user services, technical support and operations (UNIX,WinNT,SQL,DBA's,RAS, enterprise wide applications and office automation), technical upgrades, co-ordination with UN entities and non-UN Vendors, planning of staff training, document imaging, UN official documentation, electronic distribution and access, and e-commerce. The incumbent will also develop standards for the Service in hardware and software evaluation, co-ordination of IT research in the Service, e-Mail, groupware, workflows, methodologies, consulting for IT departmental projects (review of RFP's, Due Diligence Visits, risks assessments, etc.), applications support, and special projects. He or she will also manage budget formulation and expenditure control, policy co-ordination, contracting and contract management, costs analysis and billing, as well as human resources policy co-ordination and the supervision of Information Systems personnel within IMS. The incumbent will also determine and ensure the development of security related policies including access policies, security administration and information.

The ideal candidate would have an Advanced University degree in a technology-related field such as information management, computer science, mathematics, physics, statistics or the relevant disciplines. MBA with major in Finance an asset. EXPERIENCE: a minimum of 14 years experience is required, including six years of international and supervisory experience in formulating strategic plans, design and architectures for addressing business problems and managing implementation of solutions. Experience in leading a development team to problem solution is an advantage. Extensive knowledge on a range of computer languages including C, C++, Perl,Java,Java-script,Visual Basic,Access, HTML,DHTML,SHTML,Microsoft OLAP,SQL. Advanced skills, Client Server Programming, and hands-on experience with interactive systems are required. Experience with both large scale general purpose and smaller dedicated systems covering various fields of application and database management (Multi-currency Accounting and Management Reporting) is also required. Must be thoroughly familiar with Reuters, Bloomberg, SWIFT, DataStream, ILX, Bridge Information Systems, Comparion, Internet, Dow Jones Telerate, Turret Systems. Thorough knowledge is also required in Windows NT 4.0,Windows 98,Windows 95, Netware 4.x and 5.x, Notes, SYBASE, Oracle, UNIX, Solaris and Linux. The analyst manages security of the network by performing daily backups and storing them on off-site storage; manages the helpdesk and provides users with efficient support on connectivity and productivity applications. Must be certified (or re-certified within the last five years) in one of the following Microsoft Certified Systems Engineer + Internet; Microsoft Certified Systems Engineer: Microsoft Certified Database Administrator; Microsoft Certified Solution Developer: Microsoft Certified Professional + Site Building; Microsoft Certified Professional + Internet; Microsoft Certified Professional, PLUS any one of the following: Certified Novell Administrator (CNA) or Certified Novell Engineer (CNE) or Master CNE or Certified Directory Engineer or Certified Novell Instructor (CNI) or Certified Internet Professional (CIP).

Fluency in English is required; working knowledge of other UN languages is desirable. Qualified women are encouraged to apply.

The United Nations offers a competitive benefit package. (Please refer to our homepage, www.un.org, for further information)

Deadline for applications: 5 December 2001

Detailed curriculum vitae including date of birth and nationality should be sent to: 01-0-JSP-002003-E-NY, Staffing Support Section, Office of Human Resources Management, Room 2475C, United Nations, New York, NY 10017

Fax No: (212) 963-3134 or (212) 963-9560 E-mail Address: Staffing@un.org

Due to the volume of applications, all internal candidates and only those external candidates under serious consideration will be acknowledged.

Advertising Supplement

IT Careers in Illinois



While information technology may have first boomed on the nation's two coastlines, the state of Illinois ranks as the number 3 state for size of IT workforce for all disciplines of computer science/engineering. Among the reasons is the range of companies found in Illinois requiring IT expertise, from retail to consulting to financial services to insurance.

Lorraine Balun, technical recruitment manager for **Allstate Insurance Company** in Northbrook, says, "We want our customers to be able to reach us in the manner they want – through our agents, our call centers or through our web site. This speaks to having a top-notch IT organization to help make this happen."

Allstate hires individuals with expertise in a broad range of technical areas, including legacy and client server skills. "We want the technical person who is a team player and has the ability to work with the internal business client," says Balun. "We are a family-oriented company where people have opportunity and variety in their work, and where you can share in the company's success."

Closer to the heart of Chicago is the headquarters for **Andersen**, formally known as **Arthur Andersen LLP**. **Andersen** has worked to remain stable over the past year, continuing its focus on mid-market companies in addition to expanding to larger clients. Jim O'Malley, director of recruiting for **Andersen's** business consulting unit, says most of **Andersen's** customers worked over the past five years to make themselves more nimble and able. When large-scale companies were adopting ERP in the late 1990s, the mid-market wasn't so much a target customer base. "They didn't have the scale to be a target at that time," he says. "Now they are. And the ERP product we provide to them with our partners has evolved. It's more sophisticated, broader in terms of its modules, is web-enabled and increasingly integrated with other solutions, such as customer relationship management, sales/marketing service and support."

Andersen selectively hires. "We need individuals who have technical solution skills in a variety of areas – applications development, software engineering, enterprise application integration, infrastructure, wide area networks, voice over IP and security," explains O'Malley. "People who meet our high standard want to work here. We have a principal – think straight, talk straight. It says a lot about our values. We provide to our clients a full scope of disciplines, but we provide action that speaks as one."

For more job opportunities with firms in Illinois, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.
- Produced by Carole R. Hedden
- Designed by Aldeboron Graphic Solutions

OPERATIONS MANAGER
Townsend Computer Technologies seeks an Operations Manager to oversee maintenance activities for mainframe and laser printing equipment; and manage team of field service engineers in performing problem diagnosis and repair. Position requires a Bachelor's degree in Electrical, Electronic or Mechanical engineering or equivalent work experience, and prior experience in field service management. Candidates must also have expertise in IBM mainframe equipment and peripherals, and production laser equipment.
Send resume to:
Personnel Townsend Computer Technologies
318 Manley Street Unit 3 West
Bridgewater, MA 02379

Atos Origin Inc. is seeking dynamic professionals to join us in our offices in OH, NJ and CA for the following positions: SAP Consultants, Tibco-Marcator Developers/Consultants, E Commerce Professionals - including Visual Basic, Web Applications and Lotus Notes, Supply Chain Management Consultants and Application Support Specialists. A BA/BS or equivalent work experience required. Travel to national client sites is necessary. For consideration, forward your resume, with Job Code JHCW102201 to careers@atosorigin.com or by fax to 888-551-8223. EOE
ATOS ORIGIN

Computer/Info Systems

ONE, Inc. is a national consulting firm exclusively focused on our customers' demand chain. We seek the following professionals to join the ONE, Inc. team:

- Software Engineers
- IT Project Engineers
- Programmer Analysts
- Financial/Management Analysts

Consultants with in-depth knowledge of one of the following technologies: ATG, iPlanet, Silverstream, Java, Java Script, Seibel, MFC, ODBC, Visual Basic, GUI, Shell Scripts, C++, Visual C++, MS SQL Server. Requires BSCS/EE or MSCS/EE and 0-3+ years experience.

Our locations include Austin, Dallas, Houston, Plano and San Antonio, TX; Chicago, IL; San Francisco and Los Angeles, CA; Boston, MA; St. Louis, MO.

Applicants must have work authorization to accept permanent employment in the U.S. We offer a competitive compensation and benefits package. Send cover letter, resume and transcripts to: ONE, Inc., Corporate Headquarters, 2895 Greenspoint Pkwy., #500, Hoffman Estates, IL 60195. An Equal Opportunity Employer.

ONE, Inc.

divine, inc., computer software applications developers and consultants, are seeking qualified applicants for: Senior Consultants, Consultants, Systems Analysts, Software Developers, Analysts/Programmers, Technical Writers, Business Analysts, Systems Engineers, Software Engineers, Development Directors, Gateway Developers and Leader Developers. Openings are available at the companies' offices in Chicago, IL; Grand Rapids, MI; Indianapolis, IN; Plymouth, MN; Cincinnati, OH; Independence, OH; Denver, CO; St. Louis, MO; Los Angeles, CA; Irving, TX; Fairfield, CT; and Columbus, OH. Interested applicants should forward their resumes, divine, inc., Attn: DK 1,3333 Warrenville Rd. Lisle, IL 60532 or by fax addressed to DK 1 at: 630-799-7508. EOE

NET2S

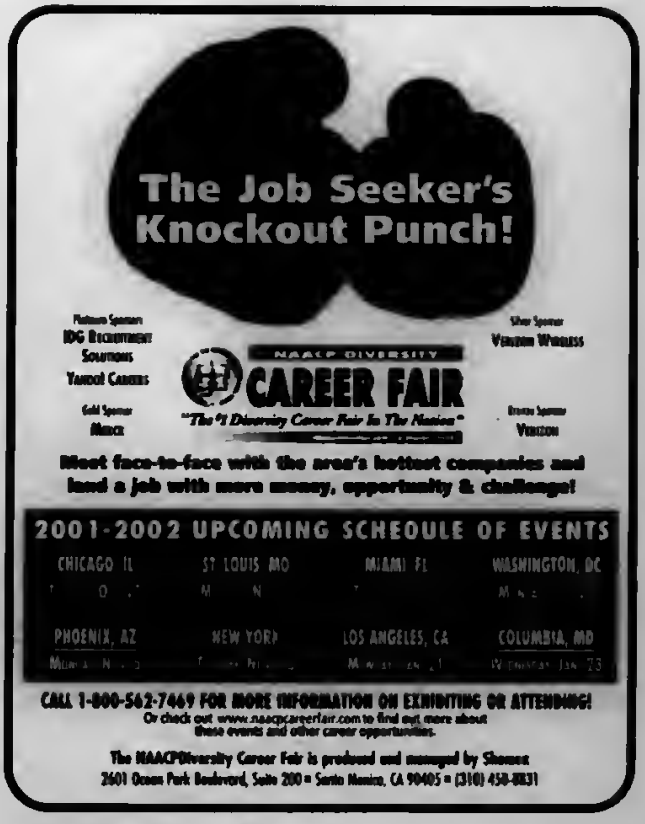
NET2S is a leading International Consulting and Engineering firm specializing in networking and communications technologies. We are presently seeking to fill the following positions:

- Sr. Unix Administrator
- TIBCO Engineer
- Network Security Specialist
- Telecom Engineer
- Sr. Software Engineer / Developers

All positions require BS/MS degree with a minimum of 2 to 3 years of experience in the field. Must possess excellent communication skills as well.

NET2S, 62 Wall Street Suite 400, New York, NY 10005; Fax: (212) 279-1900; Phone (212) 279-6565, or Email: jobus-ny@net2s.com

careers
where the best get better
1-800-762-2977



Senior Programmer/Analyst sought by company in Denver, CO specializing in business software solutions to work in Denver, CO and other unanticipated job sites in the US. At a senior level, design & develop software applications & web-based integrating software infrastructure for the company's suites of applications that access relational database management systems. Analyze requirements. Create designs & design documentation. Code, test, & de-bug the software applications. Engage in project management as required. Use SQL, JAVA Servlets & JAVA Applets on IBM Websphere, XML, Swing & JAVA Server Pages in the design & development process. Requires Bachelor's or foreign equivalent in computer science or related field, including electrical engineering, 2 yrs exp in designing & developing computer software applications using JAVA Servlets & JAVA Applets, working knowledge of XML, SQL, Swing, JAVA Server Pages, relational database management systems, & IBM Websphere 8am-5pm, M-F, $65,000/yr (3 openings) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver CO 80202 & refer to Job Order Number CO5006299.

Senior Software Engineer sought by company in Denver, CO specializing in business software solutions to work in Denver & other unanticipated job sites in the US. At a senior level, design & develop software applications and/or software tools that incorporate client/server architecture &/or are web-enabled. The software applications interface with a variety of relational database management systems & are platform independent. Analyze requirements. Create designs & design documentation. Code, test, & de-bug the software applications. Engage in project management as required. Use C/C++ object-oriented design techniques & Unified Modeling Language (UML) in the design & development process. Requires Bachelor's or foreign equivalent in computer science or related field, 2 years exp in designing & developing computer software applications that interface with relational database management systems using

C/C++, object-oriented design techniques & Unified Modeling Language (UML) M-F 8am-5pm, $60,000/yr (2 openings) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver CO 80202 & refer to Job Order Number CO5006249.

IndiaHQ seeks CTO for Bellevue, WA. DESC: Mng & supr dsgn & impl of comm'l websites, inc hosting & backend arch. ERP sys's & solns. RDBMS, internet/web enablmt app's. LAN/WAN networking solns, & internet security. Meet w/ new & existing clients. Det Proj specs & structure custom dev proj. Coord w/ engr & dev team members. Rev & troubleshoot dsgn proposals, sys's & app's. Dev, mng & nvg new market entry, alliances, comp & sales, marketing & revenue opp's. Dev sales strat, initiatives & plan channels for new markets & loc's. REQ: MS or BS in Engr, CS, Math or Phy + exp manage proj dev teams thru full life cycle dsgn, dev & deployment of ERP sys's & solns, RDBMS, internet/web enablmt app's, & network solns. Dsgn impl & and network & internet security tech. Prem sal, bns, + bonus. Pls rsp: A Sinha, IndiaHQ Solutions, 235 140th Ave NE, Bellevue WA 98005. Job # HQ-101.

Director of Technology, Englewood, CO & other unanticipated locs in US. Leads team of s/ware engrs & Business Analysts to plan, architect, dsgn & direct dvlpmt of s/ware prgms for Enterprise Applic Integration & Internet enablement projects. Drive web-based architecture for dvlpmt & deployment of applic mgmt tools & utilities. Provide technical leadership to prgrng team in working on technologies & platforms the C++, Java, Perl, ADK, OS/390, IBM Network Dispatcher, TCP/IP based communications, messaging s/ware like MQSeries, workflow automation products like MQ Workflow, & building scalable, distributed, high performance transactional systms. Provide Technical Leadership in dvlpmt of clients' eBusiness/integration strategy. Deliver technical presentations & "technology choice" recommendations to clients. MS in Comp Sci/Eng/CIS/Mathematics w/3 yrs supervisory exp in job offd or related occupation. 40 hr/wk, $80K/yr. Mail resume to CO Dept of Labor & Employment, Attn: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe St, Denver CO 80202-2117 referring to JO# CO5006200.

Panas Consulting, Inc. (www.panas-usa.com) is an IT boutique headquartered in Houston, Texas. We are distinguished by our commitment to Value Realization along the various points of the Value Chain, bridging ERP to Data Warehousing and E-commerce. We are looking for the following:

Business Intelligence (BI) Practice Lead

The successful candidate will have extensive experience in managing full life cycle development of large data warehouse/mart projects using SAP's data warehouse module BW, creating overall data warehouse/mart architecture plans, documenting business needs, leading product selection activities, estimating project costs, and presenting and marketing solutions to senior executives of client organizations. Candidates must have proven experience developing, growing and leading a Data Warehousing/Business Intelligence practice in an SAP environment.

Candidates will be expected to assist in Business Intelligence/Data Warehouse business development proposal development, and partnership development and should have proven experience in each activity. The successful candidate will be able to establish executive level relationship, provide subject matter expertise, and identify new opportunities in support of the sales and marketing process. Requires 5+ years of experience.

Send your resume with job code to: Kathylene Theus, Administrative Assistant, 10701 Corporate Drive, Suite #360, Stafford, Texas 77477.

Programmer/Analyst

Responsible for product software GUI analysis and development. Leading the design, development, and product support efforts of GUI client-side software. Software analyses, detail design, coding, unit testing, documentation and code maintenance and enhancements. 40 hrs/wk; $42,432 72/yr. Bachelor's degree or equivalent in Computer Science or related field. Must have proof of legal authority to work in the United States. Send your resume and social security number to: Indiana Department of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277. Attention: Mr. Tim Lawham. Refer to JO# 8130945. Employer paid advertisement.

RadiSys seeks High-Tech workers for Hillsboro, OR office: Job #620. Telecom S/W Engineers: DESC: Resp for specification, design & validation of real time s/w systems for telecom products. REQS: BS or MS in Engr, C.S., Math or Phy + exp dsgn, dev & impl o/s architecture & apps, util, obj. oriented meth. & C/C++ on real time o/s. Facil. data comm & ntwk. mngmnt, util, VoIP & TCP/IP. Job #619, ASIC Design Engineers: DESC: Under supervision of sr. engineers, dev & impl application specific integrated circuit designs. REQS: BS in Eng, Comp Sci, Math or Phy, plus 3 months work or academic exp. in semiconductor device des, util Verilog, VHDL & analog & digital circuit des., sim. & synthesis tools & techniq's. Exp may be gained concurrently. Prem. salaries, avail + bens & bonuses. DOE. Pls reply to: K. Mitchell, RadiSys Corp., 5445 NE Dawson Creek Drive, Hillsboro, OR 97124. Job # must be indicated on your response.

Analyst Programmers for a consulting firm in a mainframe environment utilizing COBOL, CICS, DB2, VSAM, MUMPS, VAXDSM. Send resume to Sanford Rose Assoc - Charlotte, 338 South Sharon Amity Rd., #374, Charlotte, NC 28211, or fax to (704) 365-0520.

Database Administrator wanted by net market maker for intellectual property in Pasadena, CA. Responsible for timely development and deployment of database throughout entire system development lifecycle. Provide support for all database-related activities including support of Oracle databases and Oracle tools. Bachelor in Electrical Eng or Computer Science required. Send resume to David Stuart of The Patent & License Exchange, Inc., 245 S. Los Robles Ave., 5th Fl., Pasadena, CA 91101.

"Business Information Systems Analyst: Program & write in 4th GL including Access and SQL. Integrate data across multiple platforms. Create & design reports. Interface with management & end-users. Perform database and system administration tasks. Design logical & physical databases. Req. Bachelor's in Business Administration, Computer Science or Public Administration. 40-hr wk. Job/Interview Site: LA County, CA. Send resume to Attn: Recruiter, AIDS Healthcare Foundation, 6255 Sunset Blvd., Los Angeles, CA 90028."

Software Engineers, Programmer Analysts, Database Analysts, Network Administrators, Systems Analysts needed by NJ & CA based IT firm. Will need bachelors plus 1 year of exp. for junior level positions, and Masters plus 2yrs or Bachelors plus 5yrs of exp. for senior level positions. Please apply with 2 copies of your resume to H.R. Department, Vision Consulting Group, Branch Office, 1440 Koll Circle, Suite 110, San Jose, CA, 95112.

Protech Solutions, Inc. Delivers innovative IT solutions to business clients nationwide. We have immediate full time opportunities for Programmers, Engineering Programmers, Programmer Analyst, Systems Analyst, Software Engineers, DBA's, Consultants and Software Consultants in any of the following areas: LAN/WANEnterprise NW, MS Exchange, Web Server, Terminal Servers, Desktop Deployment, &oftware Distribution, Visual Studio, Java, C++, Oracle Dev 2000, MTS, MSMQ, DCOM, Active X, SQL, DBA, MCSD, OCP, HTML,SCJP, DHTML, XML, ASP, XSL,CSS, MCD,COE,OL,CICS, DB2, IMS,VSAM,TCL, PL/I, DBA, S/370 ES, 6000,ADABAS, Natural, ERP &ystems, SAP PeopleSoft. Bachelor's /Master's Degree required, depending on position. We also accept the foreign educational equivalent of the degree, or the degree equivalent to education and experience. Excellent benefits. Send resume/salary req. to: HR, Protech Solutions, Inc., 124 W. Capitol, Suite 550, Little Rock, AR, 72201 or HR@protechsoft.com

Senior Software Engineer sought by company in Denver, CO specializing in business software solutions to work in Redmond, WA & other unanticipated job sites in the US. At a senior level, design, develop, install, configure, & debug software applications including production & prototype collaborative commerce software applications on current & future Microsoft platforms. Engage in extensive testing of the software applications, advise development teams of features & prototype platforms. Develop & maintain project plans & system code. Use COM/DCOM, C++, Active Server Pages (ASP), Extensible Markup Language (XML) & other tools & languages in the process. Requires Bachelor's or foreign equivalent in computer science or related field, 1 yr exp. in the design & development of computer software applications utilizing COM/DCOM, C++, Active Server Pages (ASP) & Extensible Markup Language (XML) in the development process. 8am-5pm, M-F, $75,000/yr (2 openings) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver CO 80202 & refer to Job Order Number CO5006255.

Human Resources Manager. Plans and carries out policies relating to all phases of personnel activity for software development and consulting business to include: transactions on new hires, promotions & terminations, employee benefits & transfers; plan recruitment campaigns and new hires and suitable placements for specific computer positions; provide technical information specifications for development of HR computer information system; to compile, store and retrieve employee data; draw up new employee contracts relating to confidentiality of trade secrets and proprietary products; check for prior breach of contracts, and advise management on adverse effects of hires with on-going contract litigation; supervise employee indoctrination program and handle employee/contractor problems. Must have degrees in computer science, engineering or math related and in business administration (personnel management) and atleast 5 years employment experience in IT industry $80,000/year. Apply by resume only, to: CEO, Time to Market, Inc., 4010 Moorpark Avenue, Suite $205, San Jose, CA 95117.

Engineer/Software. Design & manage software systems/projects for Internet gateway using Java, XML and Bluetooth stack APIs. Req's MS in Engineering or related. Send resume to: Linkware Tech Inc, Attn: Robert Head, 21070 Homestead Rd, Suite 105, Cupertino, CA 95014. EOE.

PROGRAMMER/ANALYST. No experience required. Design and develop applications using MS Access, SQL, VB, Inter Dev & Business Objects. Assist in design and test of data import, conversion tools for sales + finance reports. Required: Bachelor of Science in Business Administration/Information Systems, or Computer Science or in a related field, 40 hour-week, Job/Interview Site: Beverly Hills, CA. Send resume & this ad to: Mission Critical Technologies Inc. 9744 Wilshire Blvd. Suite #445, Beverly Hills, CA 90212.

Computer Engineers wanted for an Illinois based manufacturing company to work in Elgin, Illinois to design, develop and maintain software systems for manufacturing applications and analyze software requirements. Must have Bachelors in Computer Engineering plus 1 year in job offered. Fax resumes to Rayaraj Chaudhari at 815-988-8340, Image Technology, Inc. Put code CE101 on the resume.

SOFTWARE ENGINEERS (8 positions) require Bachelor's in Engineering/Computer Science/Mathematics/Science or closely related field with experience providing skills in described duties, or $60,000 per year. Senior Software Engineers (8 positions) with Master's and two years experience, or $65,000 per year. Provide on-site consulting in design, analysis and development of software applications for legacy systems in IBM mainframe environment; development and administration in Oracle DB2, SQL Server and Sybase; e-commerce and web applications development in Microsoft, Java and related technologies; network management systems developed with Netscape Server and related tools; SAP R/3 applications on Windows with DOS and ABAP/4 and related modules; 40% travel to client sites in the United States. Mail resumes to: YASH Technologies, Inc., Human Resources, 608 17th Avenue, Suite 1, East Moline, IL 61244.

Engineers and Programmer/Analysts needed for Park City, IL based software company. Sengemini Corporation has several senior and mid-level positions available for qualified candidates possessing MS/BS or equivalent and/or relevant work experience. Work with 2 of the following: Java, Rational Suite, EJB, Apache, Documentum and XML. Send resume to: Sengemini Corp., Attn: HR, 401S. Greenleaf, Ave., Suite 2, Park City, IL 60085.

Electronic Commerce Application Developer
Broomfield, CO

Duties: Full Life Cycle Development: Define project definition & scope. Analyze & write requirements, & perform detailed e-commerce application design & development using advanced object-oriented methodology & tools, such as Rational Rose, TogetherSoft, SQL & PL/SQL. Use Oracle DBMS & Sun Solaris to develop & maintain eCommerce code. Responsible for diagnosing debugging & troubleshooting applications. Perform unit & integration testing. Provide production application support. Requirements: Master's degree in Computer or Technology-related field. Hours & Salary: 8:00 a.m. -5:00 p.m., M-F, $65,000/yr. APPLY BY RESUME ONLY TO: Job Order #CO5006216, Colorado Department of Labor & Employment, ATTN: Mr. Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117. MUST PROVIDE PROOF OF LEGAL RIGHT TO WORK IN U.S.

Programmer Analyst. Sought by Englewood Colorado consulting company to work in various unanticipated locations throughout the U.S. Analyze, plan, develop, test, and document computer programs including network communication programs. Evaluate user requests and software programs for new and modified programs. Write program specifications, code, test, and debug computer programs. Customize hardware and software to client needs. Use of Cobol, MVS, IMS, DB/DC, VSAM and JCL. Reqs. Bachelors in Computer Science, Computer Engineering or related field of study. Plus 2 years in the job offered or 2 years in a related occupation such as e Analyst/Programmer or Systems Engineer. Will accept three years of college education plus three years of related experience in lieu of required education and experience. $65,000/year, 40/hrs/we, 8AM-5PM. Respond by resume to Colorado Department of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117, and refer to Job Order No. CO 5006343.

Sr Information Systems Analyst (2 pos) Englewood, CO. Plan, schedule & direct prep'n of prgms to process data & solve probs by use of comp. Consult w/management & systms analysis personnel to clarify prgm intent, identify probs, suggest changes & determine extent of prgmg & coding req'd. Assign coord & review work of prgmg personnel. Analyzes and runs on comp to correct or direct correction of coded prgm & input data. Train subordinate in prgmg & prgm coding. Prescribe aids for terms & symbols used to simplify interpretation of prgms using SQL, C++, Java, Dbase, Paradigm Plus & Sybase. M.S. (or foreign deg equiv) Comp Sci/Comp Info Sys/MIS/Eng/Math/Statistics +3 yrs or BS +5yrs exp in job offd or related occupation. 40 hr/wk, $75K/yr. Mail resume to CO Dept of Labor & Employment, Attn: Jim Shimada, Tower 2, Ste 400, 1515 Arapahoe St., Denver, CO 80202-2117, ref to JO# CO 5006195.

Computer Programmer Converts data from project specs of problems/procedures to create/modify computer programs: E-Commerce & POS field mgmt , software/ website/maint. Digital-PCS programming-Network Voice/Data Switching. Req. 4 yrs. exp. Send resume to The Cellular Touch, HR-PM. 1165 N W 76th Avenue, Miami FL 33126.

Software Developer wanted for consulting & business integration co. in Westbury, NY Dsgn, eval, prgm & implmt VB sfware systems & maintain SQL Server d/base mgmt comp systems. Prep technical documentation & manuals. Reqs BA in Electronic Engg, Comp Engg or closely related field & 2 yrs exp in job offd. Reply to hr@dcs.com, Darby Corporate Solutions, Inc, 865 Merrick Ave Westbury, NY 11590.

SAP HUMAN RESOURCES APPLICATIONS CONSULTANT, 8am-5pm. Research, develop and design computer software systems as they relate to HR management functions such as payroll, benefits and time management. Required: proficiency with SAP HR and SAP ABAP/4, ASAP Cert. B.S. in IT or related field, or equiv. Send Resume: ted.bromberg@cedar.com An Equal Opportunity Employer

F/T Systems Analyst responsible for computer programming, systems analysis, design, coding, system implementation, maintenance, program management, and documentation other data processing services using SQL, C/C++, Java, Lotus Notes/Domino, RDMS, PERL, and CGI. Must have a BS in Computer Science. Must have 2 yrs of exp in the job offered or a position with same duties. Salary Competitive. Send resume to: Bob Stevenson, Job #SAC-108 E.C.S., Inc., 8744 Main Street, Suite 101, Woodstock, Georgia 30188

SW Engineers: Research, dsgn & dvlp power SW sys w/ Java/ J2EE, EJB/JDBC, C/C++, Power Tool, PowerBuilder (PB), Linux & Autolisp. Convert DB from mainframes sys to Oracle/Sybase relational DB w/ ProC, PL/SQL, Unix Shell & data loading utilities. Devlp GUI w/ J2EE, EJB, PB, PL/SQL & Oracle 40hrs, 8-5. BS or foreign equivalent in any eng'g related field, 1 yr wk exp in job offered or in any other SW dvlp'ing position involving PB, Java & Autolisp. Resume to HR Office, Energy Softworx Inc. 12100 Race Track Rd, Tampa, FL 33626 /email: hr@energysoftworx.com

DATABASE ADMINISTRATOR sought by electronic billing co. in San Antonio, TX. Must have Master's Degree. Respond by resume to Mr W Su, VP., GVZ, Billserv Inc., 211 North Loop 1604 East, Ste 100, San Antonio, TX 78232

Anima Computer (TX) Corp. is looking a Technology Transaction Consultant. Please fax resumet to (713) 983-0720; or mail to 9600 West Gulf Bank, Houston, Texas 77040, Attn: HR Manger.

IT Consulting & Services Co. seeks Computer Systems Analyst-SAP to work in Atlanta, GA area to analyze client user requirements/procedures/problems to improve existing computer systems for business process applications; develop/implement/ integrate systems to SAP modules. Travel required (95% of work schedule). 2 yrs. exp. in job required. Bachelor's Degree or Comp Science/Business Admin. Send resumes to H.R. Dept., CCAI, 5600 Landerbrook Dr., Mayfield Hts., OH 44124. EOE. No calls.

Information Technology Officer. Will lead development and implementation of information systems, including global projects for operating systems standards and migrations and validation of computer controlled laboratory equipment and measurement systems to follow FDA standards. Minimum: Bachelor's degree CIS/ related field, and 1 year experience in job offered or 5 years experience. IT/Systems Analyst. Applicants with any suitable combination of education, training or experience are acceptable, respond by sending resume only, to duplicate, to Director of HR, Lonza Biologics Inc., 101 International Drive, Portsmouth NH 03801

ASSISTANT NETWORK ADMINISTRATOR to under supervision, design, implement, and troubleshoot client/server solutions and network connectivity for Windows server in LAN/WAN environment; setup, configure and maintain Remote Access Server, Oracle and SQL Server, Cisco routers and switches; coordinate network security measures. Require: Bachelor's degree in Computer Science/ Information Systems/Business Administration and six months experience. Competitive salary. 9 am to 5 pm, M-F. Mail resume to Director, Jastron Technologies, Inc., 2821 Cole Court, Norcross, GA 30071

Technical Consultant sought by company in Denver, CO specializing in business software solutions to work in Denver & other unanticipated job sites in the US. Under close supervision, engage in moderately complex tasks providing technical implementation assistance, support & training regarding business software applications & tools that run in a client/server environment or are web-enabled & which interface with a variety of relational database management systems. Troubleshoot & resolve business process & application issues that arise; test solutions, & act as liaison between users & the applications & tools development groups. Requires Bachelor's or foreign equivalent in business administration; working knowledge of business process issue resolution & business software implementation (working knowledge may be gained through employment experience or in an academic setting); 8am-5pm, M-F, $40,000/yr (2 openings). Respond by resume to: James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II #400, 1515 Arapahoe, Denver, CO 80202. & refer to Job Order Number CO 5006247

NETWORK ADMINISTRATOR wanted by a construction company in Northbrook, IL. Must have a Bachelor's Degree in Computer Science/Engineering with 2 yrs. exp. in the job offered. Respond to: President, & Star Construction, Inc., 3100 Dundee Road, #705, Northbrook, IL 60062

Software Engineers. Plano, TX. Design, develop, code, test & debug software apps using Java (J2EE), C++, CORBA and JavaScript. Req: BS in comp sci, engg, or related/tech field & 3 yrs of exp as programmer or analyst. $74K. Resumes to: Doug Hull, Viewlocity, Inc., 3475 Piedmont Road, Suite 1700, Atlanta, GA 30305

Database Analyst wanted by Insurance co. in Houston, TX. Respond to: Jerry Lee, Senior VP, New Era Life Insurance, 200 Westlake Park Blvd., Houston, TX 77079.

Call your ITcareers Sales Representative or Janis Crowley 1-800-762-2977

Senior Technical Training Analyst sought by company in Denver, CO specializing in business software solutions to work in Denver & other unanticipated job sites in the US. Research industry trends & developments, especially new technologies, & act as resource for individuals who are creating training curricula & programs. Research & test middleware platforms & interoperability software that allow different software applications to communicate & share data. Design & develop interoperability software prototypes & modules, & test & de-bug these prototypes & modules. The interoperability software & middleware interface with a number of relational database management systems. Use Java, CASE tools, GUI tools, C++, XML, HTML,& other tools & languages in the development & testing process. Engage in training & project management as required. Requires master's or equivalent, specifically a Master's degree in Computer Science or related field plus 3 yrs. of progressive software experience or a Bachelor's degree in Computer Science or a related field plus 5 yrs. of progressive software experience, working knowledge of relational database management systems, C++, & XML. 8am-5pm, M-F; $68,000/yr. Respond by resume to James Shimada Colorado Department of Labor & Employment, Employment & Training Division, Tower II,#400 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO 5006250

Technical Consultant sought by company in Denver, CO specializing in business software solutions to work in Denver & other unanticipated job sites in the US. As part of the Advanced Technologies Laboratory research, analyze & test new software products to determine their compatibility with existing enterprise resource planning (ERP) software products. Engage in testing & benchmarking activities. Make technical recommendations to development groups regarding how standard ERP client/server software applications should be modified & enhanced to make them more compatible with new software products and technologies. Make recommendations as to how source codes should be enhanced &/or modified to improve compatibility with new technologies. In addition, engage in post-sales implementation of software applications, including developing interfaces between new applications & legacy software systems. Engage in project management as required. Requires Bachelor's in computer science or related field, 1 year exp. in developing or providing technical support to enterprise resource planning client/server applications 8am-5pm, M-F $58,000/yr (2openings) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver CO 80202 & refer to Job Order Number CO5006244

Systems Analyst/Programmer

Must have a 4 yr Comp Science Degree or equivalent & exp in analysis, design & development of customized software solutions. Background in finance, agriculture, forestry or energy a plus. Travel Required. Contact: Ria N., Online Business Systems, 8100 34th Ave., ste 130, Bloomington, MN 55425 or Fax to 952-814-0073

BEST Consulting seeks the following for its HO office in Kirkland, WA.
• S/W Engr. Job#CCL-87 DESC: Dsgn, dev impl, & test RDBMS & rel. multi-tiered dist progs & apps. util. SQL, C++, XML/UML, & Java on multi plats incl Unix, Solaris, & Win NT o/s. Dev test tools for use in unit, performance, & scalability tests. REQ: MS or Engr., CS, Math, or Phys + 2 yrs exp. dsgn, dev & impl. RDBMS & rel. aps. util. SQL, C++, & Java on Unix & Win NT o/s.
• Comp Sys. Analyst #CCL-85 DESC: Prov comp sys consltng to max info sys efficiency. Anlyz existing sys & user reqs. Dsgn, dev & enhnce info sys incl. RDBMS & ver web based aps. util. SQL, HTML, JavaScript, Java applets, & Java based tech on Win. o/s. REQ: BS in CS, Engr., Math or Phys. + 1 yr. exp. dsgn., dev & impl. RDBMS & rel. web based aps. util. SQL, JavaScript, Java applets, & Java based tech.
BEST Consulting seeks the following for its Sacramento office.
• Sys. Analyst. Job #CCL-86 DESC: Provide comp. sys. consulting to max. info. sys. efficiency. Determ. clients needs, set sys. specs. Anlyz. dsgn & impl. RDBMS & rel. apps. util. SQL, Power builder, Java, & script langs. on Win. & UNIX o/s. REQ: 5 yrs. exp. anlyz. dsgn & impl. RDBMS & rel. aps. util. SQL, Powerbuilder, & script langs. on Win. & UNIX o/s. Prem. sal. plus bons & bens. Pls reply to J. King, BEST Consulting, 11255 Kirkland Way, Kirkland, WA 98033.

Sr. Web Developer (Technical Consultant) sought by company in Denver, CO specializing in business software solutions to work in Downers Grove, IL & other unanticipated job sites in the US. At a sr. level, implement, integrate, & customize Web-based software applications & middleware that interface with a variety of relational database management systems. Design & develop interfaces to integrate existing software applications with new software applications; design & develop enhancements & modifications for software applications as needed. Troubleshoot & resolve any problems that arise during the implementation process. Provide user training & support as required. Engage in project management & application development as required. Use a variety of tools & languages including Java, C programming, COM, DCOM, Microsoft Visual Studio, etc. Requires Master's or equivalent, specifically a Master's degree in Computer Science, Engineering, Science, or a related field; including Physics. Or a Bachelor's degree in Computer Science, Engineering, Science or a related field, including Physics plus 5 yrs. of software development experience; working knowledge of relational database management systems, COM & Visual Studio. 8am-5pm M-F $80,000/yr (2 openings). Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver CO 80202 & refer to Job Order Number CO 5006266

SAIC seeks experienced Software Applications Engineer with BS/MS or Comp Studies, and Oracle, SQL/PL-SQL, Java, C++/Pro*C, Windows/UNIX, OO/RDBMS skills. Resumes to H.R. Administrator, 5001 Rockside Rd., Ste. 700, Crown Center II, Independence, OH 44131 or on-line at www.saic.com.

Software Engineer sought by company in Denver, CO specializing in software development to work in Denver & other unanticipated job sites in the US. Under close supervision, engage in moderately complex tasks regarding participation in all aspects of the software development life cycle from requirement gathering to design, implementation, testing & documentation for a range of products involving technical illustrations used in the manufacturing industry for the generation of parts manuals & worksheets to assemble equipment. Working primarily using Windows NT & Windows 2000 workstations, design & develop new software applications as well as enhancements & modifications for existing technologies using Visual C++ MFC (Microsoft Foundation Class Libraries), WIN32 including Applications Programming Interface (API), linear algebra, object-oriented methodologies & graphics systems programming. Focus on designing & developing software applications for client/server databases & other progressive technologies that can run on different platforms & incorporate different relational database management systems. Work is closely monitored. Requires Bachelor's or foreign equivalent in comp. sci., elec. eng. or related field(incl electronics or electro-physics) working knowledge of Visual C++, linear algebra, & object-oriented methodologies (working knowledge may be gained through employment experience or in an academic setting) 8am-5pm M-F $50,000/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II,#400 1515 Arapahoe, Denver CO 80232 & refer to Job Order Number CO5006242.

Senior Software Engineer sought by company in Englewood, CO specializing in software dev. sales & services to work in Pittsburgh, PA & other unanticipated job sites in the US. At a senior level, engage in full life-cycle development of Geographic Information Systems software applications that incorporate client/server architecture or are web-based. The applications also incorporate relational database management systems & run on Unix or Windows operating systems. Analyze requirements. Create designs & design documentation. Code, test & debug & modify the applications. Customize the applications in conjunction with client systems, & implement the applications. Supervise programmers, serve as technical lead, develop training materials & provide training as needed. Utilize Java, Java Script & Cold Fusion & proprietary languages & tools in designing & developing the software applications. Requires Master's or equivalent. Specifically it requires a master's degree or foreign equivalent in computer science engineering or Geographic Information Systems or related field, plus 3 yrs. of progressive experience or developing Geographic Systems software, or a bachelor's degree or foreign equivalent in computer science engineering or Geographic Information Systems or a related field, plus 5 yrs. progressive experience or developing Geographic Systems software. 8am-5pm, M-F, $60,000/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400,1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO5006256



Senior Oracle Database Administrator

ArvinMeritor, Inc., a top-tier global supplier of integrated automotive systems and modules, has an opening for a Senior Oracle Database Administrator at our world headquarters in Troy, Michigan.

The qualified candidate will be responsible for providing advanced, senior-level technical leadership and expertise in the deployment and effective utilization of Oracle database and application technologies, Oracle Enterprise Resource Planning software, and information technology management tools. The successful candidate must have a Master's degree in Computer Science, Software Engineering, or a related field and three years of Oracle database administration experience or the equivalent (a Bachelor's degree in Computer Science, Software Engineering, or a related field followed by five years of progressive Oracle database administration experience). The successful candidate must also be an Oracle Certified Database Administrator. Job Code 17652A

ArvinMeritor, Inc. offers an excellent salary and benefits package, and opportunities for growth. For immediate consideration, please forward your resume and salary requirements to ArvinMeritor, Inc., Attn: C.P. fax: (248) 435-7571, email: job.opportunities@arvinmeritor.com. Please reference the job code; no phone calls please. ArvinMeritor, Inc. is an affirmative action/equal opportunity employer.

Programmer Analyst - Oracle Specialist - Multiple Openings

Structured systems analysis, design development, testing, quality assurance, implementation, integration, maintenance and support of large volume on-line complex integrated client-server based business, financial banking, manufacturing and other commercial application systems in a multi-hardware/multi-software environment using centralized or distributed database systems using Oracle Relational Database Management Systems (RDBMS) and related software. Design of large application systems and databases in a Co-operative Development Environment (CDE), and analysis, design and development of applications using CASE (Computer Aided Software Engineering) tools. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 3 of B, or 2 of A and 2 of B. A) includes Oracle RDBMS, Oracle CASE tools (Designer, Dictionary, Generator), CDE 2, Oracle Forms(4/5); B) includes PRO*C, SQL*Forms, SQL*Reporter/ter, SQL*Plus, SQL*Menu, PL/SQL. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to Pittsburgh/Allegheny County CareerLink, ATTN: JS Supervisor, 425 Sixth Avenue, Suite 2200, Pittsburgh, PA 15219. Refer to Job Order #WEB 201760

Computers/Software Developers

CommVault Systems, Inc. seeks Software Developers. Dev'ment products using C/C++ for PC/UNIX platforms. Req: Master's degree Comp Sci, Eng'g, Sys Eng'g, or rel disc & 5 yrs exp in position offered or 5 yrs exp as a programmer or systems analyst. Must have exp with MS VC++ 6.0. Res to thoffman@commvault.com. EOE.

Programmer Analyst - Legacy Systems (AS/400) - Multiple Openings

Systems analysis, design development, testing, debugging, quality assurance integration implementation post implementation support & conversion of complex on-line client-server based accounting inventory manufacturing, finance & other business application systems using Relational Database Management Systems (RDBMS) Fourth Generation Languages (4GLs) and other software utilities in a multi-hardware/multi-software environment including IBM mainframes, mid-range and PC systems. B.S. in Computer Science/Math/Engineering/Science/Business Commerce (or equivalent) and 1 yrs experience in job offered or as a Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 3 of B, or 2 of B and 1 of C, or 1 of A and 2 of B. A) includes software packages SPCS, MACPAC, MAPICS. B) includes languages RPG/400, CL, COBOL/400, SQL/400 Query/400. C. and C) includes communication/CASE Tools APPC, APPN, SYNON, AS/SET. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to: Fayette County Team PA CareerLink, ATTN: JS Supervisor, 32 Iowa Street, Uniontown, PA 15401-3513. Refer to Job Order # WEB 200588

ENGINEERING
The Enterprise Customer Relationship Management R&D team of Avaya, Inc., based in Holmdel, NJ, is seeking motivated software developers to join the team building **CUSTOMER RELATIONSHIP MANAGEMENT (CRM)** systems.

Responsibilities include: design and implementation of computer applications in C++ and Visual Basic and system programs in the telecommunications and customer relationship management area, designing the system logic, programming and implementing that logic into applications using MSMQ and MTS, creating and accessing SQL and Oracle databases running on various hardware and operating systems, testing the programs to ensure that they meet the requirements and specifications, and documenting the operating of the program for customer use.

Required Qualifications: The successful candidate must have a BS in CS, EE or instrumentation engineering, 4 years of experience as a Software Developer working with MSMQ, MTS, SQL and Oracle; 6 months of experience working on Customer Relationship Management systems; and must be a Certified Microsoft Solutions Developer. To apply, please email your resume to Dawn Paru: dparu@avaya.com. EOE.

If you want to work for a fast-paced IT company, Live Tech Solutions is the company for you. We provide exciting career opportunities, excellent compensation, a full benefits package, training in advanced technologies and more. Positions available throughout the U.S.
CURRENT OPENINGS: Computer Programmer; Database Administrator; Software Engineer; Systems Analyst; Database/ERP Analyst; Network Administrator; Programmer Analyst; Consultant; Data Modelers/Developers; and Designers.
Requires: Bachelor Degree or the Foreign Equivalent, or the equivalent in education and experience.
Please send resumes to: Live Tech Solutions, Attn: National Recruiting, 2330 Marinship Way, Suite 300, Sausalito, California 94965, or Email: ITjobs2@livetechsolutions.com

Programmer Analyst (Micro/Web) - Multiple Openings

Structured systems analysis, design development testing quality assurance implementation integration maintenance and support of integrated client server based systems for business financial banking manufacturing and other commercial business application systems in a multi-hardware/multi-software environment using centralized or distributed relational database management systems 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analysis, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B, or 2 of A and 1 of B or 3 of A. A includes Oracle Sybase, Informix, SQL Server, Progress, Ingres, Access and Proxy Server and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C, Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK). High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to: McKeesport/Allegheny County CareerLink, ATTN: JS Supervisor, 345 Fifth Avenue, McKeesport, PA 15132-2600. Refer to Job Order # WEB 201757

Systems Analyst to analyze requirements, procedures and problems to automate processing or improve existing computer system. Well versed in all phases of software development life cycle, able to design and develop commercial applications using object-oriented GUI development tools. Should be technically sound with hands on experience in building Client Server applications and distributed applications using C++, Visual Basic, Powerbuilder, RMI, CORBA, XML, TCP/IP, JSP, EJB, Weblogic, Multithreading and Oracle on Windows platforms. Bachelors Degree in Computer Science or Engineering and two years experience. Send Resume to Datum Software, 5680 Peachtree Parkway, Suite A, Norcross, GA 30092

SOFTWARE ENGINEER to design, develop, implement, test and maintain application software for the telecommunication industry in a client server environment using object oriented GUI based tools. C, C++, Visual C++, Visual Basic, Oracle and CA partner under Windows and UNIX operating systems. Plan and schedule project development and implementation, and manage resources and time. Require: Bachelor's degree in Computer Science/Engineering, Business Administration, or a closely related field with five years of progressively responsible experience in the job offered or as a Programmer/Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Roz L. Alford, Principal, ASAP Staffing, LLC, 3685 Holcomb Bridge Rd., Norcross, GA 30095, Attn: Job PG.

Oracle Applications Sr Consultant Duties: Design, implement, integrate upgrade & set-up Oracle appls software & client/server & web-based solutions using Oracle finan software. Analyze, design, upgrade & develop customization, reports, interfaces w/prod systems & conversions from legacy systems using PeopleSoft HRMS & Cendian Time & Attendance. Install & configure BnoPortal for employee corp report distribution. Provide tech & func. support & database system admin using Oracle Applications Database Admin. Requires: M.S. in Comp. or Info. Sci., Eng. or related field & 3 yrs. exp. in the job offered or 3 yrs. exp. as a Consultant, Database Adm. Analyst or Eng. Concurrent exp. must incl. 1 yr. exp. designing, implementing & setting-up Oracle applications & client/server solutions & 1 yr. exp. providing database system admin using Oracle Applications Database Admin. EOE. 40 hrs./wk., 8:00 a.m. to 5:00 p.m. Send resume (no calls) to: Diane Tuccito, AnswerThink, Inc., 817 W. Peachtree St., Ste. 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

Programmer Analyst (Micro/Web) - Multiple Openings

Structured systems analysis, design development, testing, quality assurance, implementation, integration, maintenance and support of integrated client-server based systems for business, financial, banking, manufacturing and other commercial business application systems, in a multi-hardware/multi-software environment using centralized or distributed relational database management systems. 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analysis, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B, or 2 of A and 1 of B, or 3 of A. A includes Oracle, Sybase, Informix SQL Server, Progress, Ingres, Access and Proxy Server and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C, Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK). High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to Manager, Washington County Team PA CareerLink, Millcraft Center, Suite 150LL, 90 West Chestnut Street, Washington, PA 15301-4517. Refer to Job Order # WEB 201771

SOFTWARE ENG 3 Formulate/define complex operating software programming applics specs, modify/maintain complex existing applics, design, code, test & implement programs. BS Computer Sci or equiv + 2 yrs exp in job or Programmer/Analyst. Proficient in Delphi, C & Object Oriented Programming. Exp. dvlp'ing systems w/ low level object oriented design docs. $70,574/yr. Send resume to: C. James, John H. Harland Co., 2939 Miller Rd., Decatur, GA 30035



MILLIONS OF READERS

MILLIONS OF SURFERS

ONLY THOUSANDS OF DOLLARS

TOTAL IMPACT TOTAL SAVINGS

Put your message in ITcareers and ITcareers.com and reach the world's best IT talent.

ITCAREERS
where the best get better
1-800-762-2677
ITcareers.com



System Administrator to Install, configure and support an organization's local area network, wide area network and Internet system or a segment of a network system. Bach. Degree in Int. Sys. equiv and 1 year experience. Software Engineer to research and develop computer software Systems in conjunction with hardware product development. Bach. degree in Eng, Comp. Sci or Int. Sys. And 5 years experience or Mas. Degree and 2 years exp. Send resume to ACS International Resources, Inc. 3 Innovation Way Suite 120 Newark, DE 19711

Systems Manager wanted by a Telecommunications co. in Boston, MA. Must have a Master's degree in Comp. Sci. Comp. Eng. Math or related field & 3 yrs. exp. as a Systems Admin. Consultant/ Programmer plus exp. with the following: Syst. Admin. for large groups, Unix Admin. utilizing FreeBSD and /or Linux, Web Admin. utilizing Apache and Microsoft IIS and have knowledge of one (1) or more types of scripts. In lieu of a Master's degree we will accept equivalent combination of education and experience. Please fax your resume to 973-412-3700, Net2Phone Inc. H.R. Dept. 520 Broad Street, Newark, New Jersey 07102 reference# ALGGC-801.

Systems Engineer - A world leader of multimedia digital recording solutions, applications & related professional services for business interaction management is seeking a Systems Engineer who will analyze, recommend, plan & implement installations of unique Call Logging Systems. Req'd: Bachelor's in CompSci, Engineering or related discipline w/2 yrs of related exp in computer systems/ network engineering. Must have a good knowledge of client/server architecture & exp w/C++, Visual BASIC, NT Server, workstations & MS SQL. REF #BM01 Send res to: Vivian Walker, NICE Systems, Inc, 200 Plaza Dr., 4th Fl. Secaucus, NJ 07094 Pls indicate REF#

Trusted by more human managers than any IT space in the world

careers.com

ENGINEERING GENERAL MANAGER & CEO - Overall management of the company. Ensure the project in conformance with technical contractual requirements & time schedules. Accept report from all managers. Establish company strategic goals & evaluate the managers performance. Must have in-depth knowledge of the Brazilian Air Transport System &experience with Air Traffic Control & Airports Projects. 10 yrs exper.or managing of multidisciplinary professional team with responsibility over multi-million dollar project. **PROGRAM MANAGER:** Manage, specify, develop, integrate install, quality assurance & logistic support for air traffic control & air traffic management systems. 7 yrs exper. managing min. 25 workers w/responsibility over multi-million dollar revenue. Experience w/ air traffic control & flow management, image management, command & control & simulators systems, application of mil-std procedures. **ENGINEERING PROGRAM MANAGER** - Coordinate multidisciplinary projects, experience in air traffic control, defense & surveillance systems, logistics management, technology absorption. Conduct business communications in Portuguese with Brazilian govt. organizms. & parent orgnizm in Brazil. 7 yrs management experience min. 10 professionals with responsibility over multi-million-dollar revenue. **ENGINEERING EXECUTIVE VICE PRESIDENT** - Technical, financial & commercial mgmt of procurement & acquisn of services and goods. 7 yrs exper managing min. 30 workers with responsibility over multi-million dollar revenue. Exper w/ mgmt of complex multi-disciplinary engineering projects.

All candidates must have B.S. in Engineering & fluency in Portuguese 40 hr/wk, M-F 8am-6pm. Job in Woburn, MA. Prevail Wage. Fax resume to 781-937 94 58.

NETWORK SYSTEMS ADMINISTRATORS

needed for development, implementation and administration of network workstations, server configurations, the UNIX and Windows NT operating systems, networking protocols, firewall and Oracle Database internals. Master's required in Math, Computers, Engineering or any other related field of study, plus 3 yrs exp or 3 yrs as a Network or Systems Administrator. Employer will accept 5 yrs of related, progressively responsible post Bachelor's exp in place of the Master's and 3 yrs mentioned above. Must have proof of legal authority to work in the U.S.

Salary $70,000.00/year for a 40 hour work week.

Interested applicants submit resume or C.V. to Phila. Job Bank, 444 N. 3rd St., 3rd FL, Phila., PA 19123. Refer to Job Order #WEB203474. Ad paid by an Equal Opportunity Employer.

NEED TO HIRE.
careers.com
START WITH US.

Programmer Analyst (Micro/ Web) - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of integrated client-server based systems for business, financial, banking, manufacturing and other commercial business application systems in a multi-hardware/multi-software environment using centralized or distributed relational database management systems. 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analysis, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/ Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B or 2 of A and 1 of B or 3 of A. A includes Oracle, Sybase, Informix, SQL Server, Progress, Ingres, Access and Proxy Server and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C, Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK); High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to: JS Supervisor, Greene County Team PA CareerLink, 4 West High Street, Waynesburg PA 15370-1324. Refer to Job Order # WEB 201775

IT project Manager to Participate, guide and assist in development of project development and customization plans of WEB enabled client/server applications, such as Oracle database to be integrated to a an ERP/CRM environment. Plan direct, control and report on the projects. Masters Degree in Business Administration, Information Systems or equivalent and 2 years of experience. Send resume to Pyramid Consulting Inc. 5335 Triangle Parkway, Suite 510, Norcross, GA 30092.

Silicon Valley Systech, Inc. is hiring Programmer Analysts/DBA and Software Engineers. Will be assigned to client sites nationwide. Please send resume to 1590 Oakland Road, Suite B-206, San Jose, CA 95131 Tel.No. (408) 441-7677, Fax: (408)441-7095 or e-mail to sangeeta@stechinc.com.

SENIOR PROGRAMMER/ANALYST to analyze, design, develop, test and implement application software for the mortgage insurance industry in a client/server environment using Object Oriented programming, Visual Basic, VJ++, Java Script, VB Script, Java, ASP, COM, SQL Server, MTS, XML, HTML and Rational Rose under DOS and Windows 98/2000/NT operating systems. Require B.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered. Competitive salary offered. Apply by resume to: Kenneth J. Bostman, Republic Mortgage Insurance Corp., 1100 Oak Pond Blvd, Winston-Salem, NC 27105. Attn: Job SM.

IT Integration/Engineer I. Provide basic engineering services including research, design, testing and deployment of technologies related to IT. Utilize Oracle forms and reports. Participate in projects or programs requiring engineer/systems skills. Participate in the design, deployment, and implementation of solutions that meet internal or customer requirements. Provide data and research in support of the project or sub-component. Contribute solutions, complex technical. Help to develop new or improved techniques or practices. Provide and maintain documentation about research and implementation. Provide technical assistance for operations areas. 40 Hours per week, 9:00 a.m. to 5:00 p.m. Overtime not applicable. $54,596 per year. Overtime exempt. Applicants must have bachelor's degree in computer science, engineering or related field; to address, must have one year of experience in the job offered or one year of experience as a Programmer Analyst. Qualified applicant must have one year of experience in (i) Oracle Forms development, including maintenance and support of existing applications, as well as new development; and (ii) development of Oracle Reports. Must also have six months of experience in Java development, including maintenance and support of existing applications, as well as new development. Applicants must show proof of legal authority to work in the U.S. Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois, 60605. Attention: Joanna Breaux, Reference #V-4L 29783-N. AN EMPLOYER PAID AD. NO CALLS. SEND 2 COPIES OF BOTH RESUME AND COVER LETTERS.

PROGRAMMER/ANALYST to analyze, design, develop, test, maintain and implement application software using COBOL II, DB2, JCL, CICS, TSO, IMS-DB/DC, SPUFI, CEDF and BMS in a mainframe environment. Require Bachelor's degree in Computer Science, and Engineering discipline, or a closely related field with two years of experience in the job offered or as a Programmer. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to Frank Bosman, President, Global Software Development Services, Inc. 1110 Northchase Parkway, Suite 250, Marietta, GA 30067. Attn: Job #A.

Downsizing Systems, Inc. urgently seeks: Project Analyst with min. 1 yr. industry exp in MS Project, MS FrontPage, MS Image Composer, WinNT Win 95, VAX, CAD/CAM, DSPs, AutoTester & Unisys A-series; must be skilled in knowledge mgmt, strategic planning, systems engineering, high level design architecture, research business uses & impact of tech, etc. Travel reqd. Resume only to HR, 1089 Beverly Ct., Lombard, IL 60148.

Computer Network Specialist: Works w/WAN (Wide Area Network). Design & control LAN'S (Local Area Network). Set up & control networks between central office & locations out of country. Design & program software & hardware, includ the data base warehouse over a TCP/IP Protocol. Control security system includ network security access in all wind/NT 4.0 servers & programming & designing security access in all wind/98 workstations. 40 hrs per wk, 8A-5P. 2 yrs of exp in job offered. Fax resume to (305) 593-2391

Programmer Analyst (Micro/ Web) - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of integrated client-server based systems for business, financial, banking, manufacturing and other commercial business application systems in a multi-hardware/multi-software environment using centralized or distributed relational database management systems. 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analysis, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/ Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B or 2 of A and 1 of B or 3 of A. A includes Oracle, Sybase, Informix, SQL Server, Progress, Ingres, Access and Proxy Server and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C, Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK); High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to Manager, Indiana Job Center, 350 North Fourth Street, Indiana, PA 15701-3000. Refer to Job Order # WEB 210783

MJR openings for programmer/ analysts w/Bach. Intl pgm rqrd; 2 yrs exp in pgmg for mgmt appl's, creating online reports, quality assurance & using INFORMIX 4GL, INFORMIX-Online Database Unix & TCP/IP. 2nd pgm reqd: 1 yr exp installing, maintaining & supporting comp networks using WinNT, Win 2000 & Linux. May req relocation. Send resume to Aljac, Inc. 403 Harbor Way, Ann Arbor, MI 48103.

COMPUTER PROGRAMMERS & SOFTWARE ENGINEERS

United Software Associates, Inc. is hiring all levels of Computer Programmers and Software Engineers. Travel required and will be assigned to client sites nationwide. Resumes to 221 Old Bernal Avenue, Suite B, Pleasanton, CA 94566. Tel. (925)249-0250, Fax (925)249-0252 or email to abhat@usain.com

Software Engineer: Design & develop software financial solutions & modifications (SAP R/3 configuration, installation, implementation, integration & cycle system testing) using SAP to perform systems analysis of end user's financial & related business requirements. Must Have: Associates in Business or Finance, & 2 yrs exp in SAP financial software development. F/T, M-F. Resume to McCarron, Readorf & Ingalls, 300 West Main St, Northboro, MA 01532

How to Contact Computerworld

TELEPHONE/FAX

Main phone number (508) 879-0700
All editors unless otherwise noted below
Main fax number (508) 875-8931
24-hour news tip line (508) 620-7716

E-MAIL

Our Web address is **www.computerworld.com.** All staff members can be reached via e-mail using the form: **firstname_lastname@computerworld.com.**

All IDG News Service correspondents can be reached using the form: **firstname_lastname@idg.com.**

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to: **letters@computerworld.com.** *Include your address and telephone number.*

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

SUBSCRIPTIONS/BACK ISSUES

Subscription rates: U.S., $58/year; Canada, $130/year; Central and South America, $250/year; all others, $295/year

Phone (800) 552-4431
E-mail circulation@computerworld.com
Back issues (508) 820-8167

REPRINTS/PERMISSIONS

Phone Ray Trynovich (717) 399-1900, ext. 124
E-mail rtry@rtmsreprints.com

CONTACTING CW EDITORS

We invite readers to call or write with their comments and ideas. It is best to submit ideas to one of the department editors and the appropriate beat reporter.

Editor in Chief Maryfran Johnson (508) 820-8179
Editorial Director, Print/Online Patricia Keefe (508) 820-8183

DEPARTMENT/BUREAU EDITORS

News Editor Don Tennant (508) 620-7714
Assistant News Editor Craig Stedman (508) 820-8120
Business Editor Thomas Hoffman (845) 398-9630
Technology Editor Tommy Peterson (508) 620-7729
IT Careers Editor David B. Weldon (508) 820-8166
Washington Bureau Chief Mitch Betts (202) 737-6049
West Coast Bureau Chief Penn Fox (650) 524-7716

REPORTERS

Mobile computing/telecom; health care Bob Brewin (301) 277-8069
Internetworking; telecom; Novell James Cope (219) 273-5369
Application development; Java; large systems; automotive; General assignment; e-mail; groupware; travel Lee Copeland (773) 278-0234
Financial services; storage; IT management Jennifer DiSabatino (508) 820-8122
Public B2B; online procurement; middleware; network systems mgt.; General assignment; Intel servers; transportation/carriers; Microsoft; retail industry Lucas Mearian (508) 820-8215
ERP; supply chain; CRM; databases; data warehousing; CA Michael Meehan (508) 620-7704
State/federal government; antitrust; legal issues; politics Linda Rosencrance (508) 628-4734
Carol Sliwa (508) 628-4731
Marc L. Songini (508) 820-8182
Patrick Thibodeau (202) 737-6001
Security; defense and aerospace; ASPs/outsourcing; disaster recovery; security; heavy manufacturing; General assignment; Linux and Unix operating systems Dan Verton (703) 391-2277
Jaikumar Vijayan (508) 820-8220
Todd Weiss (717) 560-5256

OPINIONS

Senior News Columnist Frank Hayes (503) 252-0100
Columns Editor Rich Sala (508) 820-8118

FEATURE EDITORS

Special Projects Editor Ellen Fanning (508) 820-8204
Editor at Large Mark Hall (503) 391-1158
Reviews Russell Kay (508) 820-8175
Special Projects Editor Julia King (610) 532-7598
Technology Evaluations Editor Robert L. Mitchell (508) 820-8177

FEATURE WRITERS

Gary H. Anthes (202) 737-7242
Matt Hamblen (508) 820-8567
Sami Lais (301) 270-1427
Kathleen Melymuka (508) 628-4931
Ken S. Nash (773) 275-4133
Deborah Radcliff (707) 829-5823
Melissa Solomon (508) 620-7754

COMPUTERWORLD.COM

Director, online and design Tom Monahan (508) 820-8218
Managing editor/online Sharon Machlis (508) 820-8231
Online news editor Ken Mingis (508) 820-8545
Online news editor Marian Prokop (508) 620-7717
Communities director Vanessa DiMauro (508) 820-8160
Communities senior editor/writer Rich Sala (508) 820-8118
Communities page editor Brian Sullivan (508) 820-7760
Communities builder Barbara Sternberg (508) 620-7782
Associate art director David Waugh (508) 820-8142
Associate art director John R. Brillon (508) 820-8216
Keeley Guillorme, **marketing associate/researcher;** Peter Smith, **Web development manager;** Kevin Gench, Mark Savery, **Web developers;** Bill Rigby, **associate Web developer;** David Ramot, **online production coordinator and e-mail newsletter editor;** Christopher Gibbons, **senior Web designer;** Matthew Morning, **graphic designer**

RESEARCH

Man Keefe, **research manager;** Allison Wright, **research associate;** Susse Wilson, **research assistant**

COPY DESK

Jamie Eckle, **managing editor/production** (508) 820-8202
Jean Consilvo, **assistant managing editor/production**
Michele Lee, Bob Rawson, **senior copy editors,** Jacqueline Day, Eugene Demaitre, Mike Parent, Monica Sambataro, **copy editors**

GRAPHIC DESIGN

Stephanie Faucher, **design director** (508) 820-8235
Mitchell J. Hayes, **art director**; April O'Connor, **associate art director**; Julie D'Errico, **graphic designer;** Susan Cahill, **graphics coordinator;** Rich Tennant, John Klossner, **cartoonists**

ADMINISTRATIVE SUPPORT

Linda Gorgone, **office manager** (ext. 8176)
Lorraine Witzell (ext. 8139), Cheryl Dudek (ext. 8178)

CONTRIBUTING COLUMNISTS

Joe Auer, David Foote, Michael Gartenberg, Dan Gillmor, Thornton A. May, David Moschella, Nicholas Petreley, Fran Quittel, Paul A. Strassmann

CONTRIBUTING WRITERS

Kevin Fogarty, Leslie Goff, Amy Helen Johnson, Mathew Schwartz

COMPANIES IN THIS ISSUE

Page number refers to page on which story begins. Company names can also be searched at **www.computerworld.com**

ADVANCED FIBRE COMMUNICATIONS INC 9
AFCOM DATA CENTER INSTITUTE 22
ALL HOTELS LTD 69
ALSTON & BIRD LLP 6
AMERICA ONLINE INC 62
AMERICAN AIRLINES INC 1,69
AMERICAN BANKERS ASSOCIATION 1
AMERICAN INSURANCE ASSOCIATION 1
AMR CORP 1
AMR RESEARCH INC 18,19
APL DIRECT LOGISTICS 18
APPLERA CORP 63
ARC ADVISORY GROUP INC 8
ARIBA INC 18
ASPECT COMMUNICATIONS CORP 7
AT&T CORP 18
BANK OF AMERICA CORP 28
BEA SYSTEMS INC 18
BELL SOUTH CORP 9
BENCHMYST INC 66
BRISTOL-MEYERS SQUIBB CO 28
BRITISH TELECOMMUNICATIONS PLC 18
CANADIAN IMPERIAL BANK OF COMMERCE INC 18
CARDINAL HEALTH INC 32
CASHEDGE INC 66
CELERITY COMMUNICATIONS LLC 1
CELERA GENOMICS 66
CENTERS FOR DISEASE CONTROL AND PREVENTION 1
CERT COORDINATION CENTER 99
CHRYSLER CORP 7
CISCO SYSTEMS INC 10,47
CITIGROUP INC 66
CLOSINGGUARD.COM INC 1
CODEFAB INC 7
COLORADO STATE UNIVERSITY 66
COMMERCE ONE INC 18
COMMUNICATIONS SUPPLY CORP 62
COMPAQ COMPUTER CORP 1,14,15
COMPUTER ASSOCIATES INTERNATIONAL INC 14
CONTROL RISKS GROUP 32
COUNCIL ON FOREIGN RELATIONS INC 6
CRITICAL INFRASTRUCTURE ASSURANCE OFFICE 8
CRITICAL INFRASTRUCTURE PROTECTION BOARD 8
CURRENT ANALYSIS INC 18
CYSIVE INC 10
DAIMLERCHRYSLER AG 7
DATALEX INC 69
DATAQUEST INC 18,19
DELTA AIR LINES INC 1,69
DEUTSCHE BANK AG 62
DEVELOPMENT CENTER FOR BIOTECHNOLOGY 32
DIGITAL DEFENSE INC 32,66
DIGITAL SIGNATURE TRUST CO 4
DYNAMESOFT INC 62
EHNE CRM INC 47
EMC CORP 19
ENTERPRISE APPLICATIONS CONSULTING 18
EXODUS COMMUNICATIONS INC 32
FBI 8,32,69
FEDERAL AVIATION ADMINISTRATION 4
FEDERAL RESEARCH SERVICE INC 47
FEDERAL TRADE COMMISSION 1
FORRESTER RESEARCH INC 7,9
FUEL QUEST INC 10
GARTNER INC 10,18,19,25,49,50,60
GB GLOBAL EXCHANGE SERVICES 10
GIBSON RESEARCH CORP 99
GRAND CENTRAL NETWORKS INC 10
GUARDENT INC 8
HALLMARK CARDS INC 18
HARVARD BUSINESS SCHOOL 32
HEWLETT-PACKARD CO 68,70
HILTON HOTELS CORP 69
HITACHI DATA SYSTEMS CORP 15
HOLYOKE MUTUAL INSURANCE CO 6
HUTCHISON PORT HOLDINGS 6
IF TECHNOLOGIES INC 15,19
IBM 1,18,19,22,32
IDC 10
INFORMATION TECHNOLOGY ASSOCIATION OF AMERICA 9,22
INFOTERIA CORP 69
INTEL CORP 19,60
INTERNATIONAL COMPUTER NEGOTIATIONS INC 25
INTERNET ENGINEERING TASK FORCE 52
INTERVOICE-BRITE INC 7
IOWA DEPARTMENT OF PUBLIC HEALTH 1
IPLANET E-COMMERCE SOLUTIONS 69
J.E. DEWITT INC 10
JUPITER RESEARCH 63
LERNOUT & HAUSPIE SPEECH PRODUCTS NV 6
LOS ALAMOS NATIONAL LABORATORY 54
LOTUS SOFTWARE GROUP 52,58
LOUISIANA STATE UNIVERSITY 32
MERIDIEN RESEARCH INC 10
MICROSOFT CORP 6,10,19,39,60,62
MOODY'S INVESTORS SERVICE 32
MORGAN STANLEY DEAN WITTER & CO 52
MOTOROLA INC 7
NATIONAL ASSOCIATION OF MANUFACTURERS 6
NATIONAL CONFERENCE OF COMMISSIONERS ON UNIFORM STATE LAWS 1
NATIONAL GOVERNORS ASSOCIATION 9
NATIONAL INFRASTRUCTURE ADVISORY COUNCIL 9
NATIONAL INFRASTRUCTURE PROTECTION CENTER 8
NATIONAL RAILROAD PASSENGER CORP 69
NATIONWIDE FINANCIAL SERVICES INC 8
NAVY-MARINE INC 7
NEC CORP 19
NETBANK INC 40
NETCRAFT LTD 69
NETEGRITY INC 10
NIPPON INVESTMENT & FINANCE CO 60
NIPPON TECHNOLOGY VENTURE PARTNERS LTD 60
NOGGIN LLC 7
NORTEL NETWORKS CORP 14,60
NORTHEASTERN UNIVERSITY 28
NORTHROP GRUMMAN CORP 32
NORTHWEST AIRLINES INC 1
NORTHWESTERN UNIVERSITY 25,34
NUANCE COMMUNICATIONS INC 7
OMRA AMERICA INC 60
ORACLE CORP 10
PATRICIA SEYBOLD GROUP INC 60
PHILIP MORRIS COS. 69
PHILIPS MEDICAL SYSTEMS NORTH AMERICA INC 10
PIONEER CORP 60
PURDUE UNIVERSITY 60
QUINTILES TRANSNATIONAL CORP 14
RBC FINANCIAL GROUP 60
REALNETWORKS INC 28
REPLANE INC 1
REUTERS GROUP PLC 60
ROSETTANET 60
ROYAL PHILIPS ELECTRONICS NV 10
RSA SECURITY INC 69
RYDER SYSTEM INC 18
SI CORP 63
SABRE HOLDINGS CORP 1
SANS INSTITUTE 69
SAP AG 14,15,19,25,47
SAVI TECHNOLOGY INC 8
SCIENCE APPLICATIONS INTERNATIONAL CORP 8
SECURITYFOCUS.COM 69
SIEBEL SYSTEMS INC 7
SIEMENS AG 60
SOCIETE GENERALE GROUP 10
SOFTBANK VENTURE CAPITAL 60
SOUTHWEST AIRLINES CO 1
SPRINT CORP 12
SUN MICROSYSTEMS INC 6,10,18,70
SYMANTEC CORP 50
TAIWAN UNIVERSITY 32
TERRAKNOWLEDGE CORP 60
TELL ME NETWORKS INC 10
THE AMERICAN NATIONAL RED CROSS 8
THE CENTER FOR DEMOCRACY & TECHNOLOGY 9
THE CLIPPER GROUP INC. 10
THE EASTMAN GROUP INC. 1,69
THE ENTERPRISE STORAGE GROUP INC. 10
THE INTERNET TAX FAIRNESS COALITION 9
THE MATHWORKS INC 69
THE SEPTEMBER 11TH FUND 8
THE YANKEE GROUP 10
THOMSON FINANCIAL 10
TIBCO SOFTWARE INC 11,60
TOWERGROUP 10,40
TUFTS UNIVERSITY 69
TWEEDALE INFORMATION SERVICES INC 8
U.S. ARMY 69
U.S. CUSTOMS SERVICE 8
U.S. DEPARTMENT OF COMMERCE 8
U.S. DEPARTMENT OF DEFENSE 8
U.S. DEPARTMENT OF LABOR 69
U.S. DEPARTMENT OF TRANSPORTATION 1
U.S. NAVY 32
U.S. OFFICE OF PERSONNEL MANAGEMENT 47
UBIZEN 32
UNISYS CORP 10
UNITED AIRLINES INC 1
UNITED PARCEL SERVICE INC 1
UNITED WAY OF AMERICA 6
UNIVERSITY OF ILLINOIS 28
UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL 66
UNIVERSITY OF NORTH CAROLINA AT WILMINGTON 38
UNIVERSITY OF PENNSYLVANIA 34
UNIVERSITY OF ROCHESTER 66
UNIVERSITY OF TENNESSEE 9
VIEWLOCITY INC 10
VIGILINX INC 32
WACHOVIA SECURITIES INC 10
WAL-MART STORES INC 19
WEBLEY SYSTEMS INC. 66
WEBMD CORP 14
WEBMETHODS INC. 60
YANTRA CORP 18
YELLOW FREIGHT SYSTEM INC 10
YOOLEE INC 40
ZONE LABS INC 50

ADVERTISERS INDEX

AT&T www.att.com 19
Canon www.canon.com 16-17
Cisco www.cisco.com 46, 47
Compaq Computer Corp. www.compaq.com 4
Computer Associates www.ca.com 2-3
Crystal Group www.crystalpc.com 18
Dell www.dell.com 11
Digex www.digex.com 24
Hewlett-Packard www.hp.com 41,42,43
IBM e-Infrastructure www.ibm.com 59
InterSystems Corp. www.intersystems.com 48
LSI Logic www.lsilogic.com/go/cw 57
Microsoft Commerce www.microsoft.com 28-29
Microsoft Visio www.microsoft.com 30-37
Oracle Corp www.oracle.com 72
Princeton Softech www.princetonsoftech.com 55
SAS www.sas.com 44,45
SBC Communications www.sbc.com 39*
Storage Networking World White Paper www.computerworld.com/mail/talkingpoints 24/25
Sun Microsystems www.sun.com 20-21
Sybase www.sybase.com 13
Unisys www.unisys.com (800) 874-8647, X3016 34-35*
Vignette www.vignette.com 71*

*Regional Select Edition

The index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Continued from page 1

Air Security

lying all in-house reservatioo systems as well as the global distribution systems (GDS), like Sabre Holdings Corp. in Fort Worth, Texas.

The GDSes give travel agents and Internet sites a single point of contact to search for airfares. Many airlines also outsource their reservation systems to GDSes.

Sabre has begun a process to move its reservation system off TPF and onto Himalaya Non-Stop servers from Compaq Computer Corp. But that process is expected to take four years.

Even implementing these security measures as an intermediate step toward a complete overhaul would be a long and costly undertaking.

"Whenever you make even the smallest changes in Sabre or any TPF environment, it takes an unbelievably long time to do it — time and resources," said Tom Cook, former president of Sabre Technology Solutions. That company became Sabre Holdings in 1999, when Fort Worth-based AMR Corp., the parent company of American Airlines, divested itself of its interest in Sabre. Cook now heads Replane Inc. in Chicago.

"The code is old and structured," Cook said. "Making changes in the TPF environment is orders of magnitude more difficult than it is in a modern environment."

Even the company that developed the reservation systems in the late 1950s and early 1960s acknowledges that security queries are going to cause performance problems.

"That could be true," said Michael Hulley, vice president of the Global Travel and Transportation Industry unit at IBM, referring to the possibility of performance problems. "The reservation system is meant for doing mostly one thing: acting at a very secure high speed with high availability. It is not looking for triggers," like a terrorist's name in the passenger list for a flight, he said.

To screen passenger names, the airlines could add another processing unit to run checks without sending the name through TPF, said Hulley. The reservation system could send passenger names to the old system, as well as to the new unit, working around the old TPF's inability to do queries. Programs that scan passenger profiles, not just names, could run in the second processor, Hulley said.

He said other types of security could also be run in tandem with TPF. "I would think that adding biometric capacity to that database, that would be done externally," Hulley said.

No Recognition

The problem with that, said Eastman, is that the government and the airline industry don't recognize the differences in each other's systems. They just think they can write some code and make it work, he said.

"They don't know what they're doing yet," he said.

However, Hulley noted, before the technological problems can be solved, the airlines and various local, state, federal and even international government agencies must first resolve the privacy and ownership issues associated with uniform information sharing.

The Federal Aviation Administration (FAA), which is under the DOT's authority, declined to comment on when or even whether the new security guidelines will be imposed.

"We want to get this stuff going as soon as possible," said FAA spokesman Paul Takemoto. When asked if the government would help fund the implementation of computer-based screening, he said, "That all has to be worked out."

- ▶Establish airport passenger screening under the direct control of a new federal law enforcement agency within the DOT.
- ▶Share law enforcement and intelligence information with those responsible for aviation security.
- ▶Deploy new technologies more widely to augment the aviation security program.
- ▶Strengthen airport passenger screening and other security procedures.
- ▶Establish a nationwide program of voluntary prescreening of passengers, together with the issuance of "smart" credentials.

The Rapid Response Team report is available at: www.dot.gov/affairs/airportsec.htm

The Technology Behind the Problem

According to Richard Eastman, president of The Eastman Group, the technology problem faced by the airlines has to do with the nature of IBM's TPF operating system.

TPF stores data in isolated "silos" that can be accessed only by using commands from a centralized processor in the system that constantly polls for data. So for a ticket agent's terminal or an airline maintenance application to send or retrieve information, it has to wait for the central system to poll it. Requests for flight reservation information have higher priority than other requests, so even though TPF is constantly polling for messages, the millions of Internet users who visit online booking sites tend to strain the ability of TPF to handle other data, Eastman said. Operations data, including takeoff information, is therefore already held up. The concern now is that the addition of requests for security information will cause severe lags in system performance.

"The security piece will cause a performance issue," agreed Jim Peters, president and chief technology officer at Datalex Inc. in Dublin. Datalex has been in the online travel business for 15 years and offers four reservation systems, pricing engines and industry analysis, as well as a booking engine that's used by American Airlines, Delta and Amtrak.

Peters said his company is now working with the airlines, governments, online travel sites and other travel-related companies to translate some customer information into XML data and perform the queries outside of the mainframe-based system.

However, because the FBI uses a pixel-based, relational database while the airlines use character-based, structured databases, the FBI must vet each name for the airlines' systems. So when the airlines check a passenger's name against a database of suspected terrorists, the name is already defined in a language the airlines' databases can understand, Eastman said. When trying to share information in real time, that creates a problem, he said.

Eastman and Peters agree that add-ons can be a temporary solution to the security problem.

"They will build an interim solution," Eastman said, "and the government will then say, 'You've got *x* period of time to give us a better system.'"

– Jennifer DiSabatino

Hotels Having Problems, Too

Hotel chains may find it feasible to do the kind of security screening the FAA is considering for the airlines, but independent or franchise hotels not linked to a central system might find it difficult to manage guest profiles.

"Hotel chains are far more capable of doing [security screening]," said Jane Karwoski, CEO of All-Hotels Ltd. in Edinburgh. "When you get down to individual hotels, it is far more difficult." Franchises are also a problem, because they have no central system, she said.

Hilton Hotels Corp. is in a position to perform security screening on the strength of its customer relationship management (CRM) system.

Tim Harvey, CIO at Hilton, said the Beverly Hills, Calif.-based company has received several isolated requests from the FBI to provide information on guests following the terrorist attacks.

"We anticipate that at some point in time, somebody's going to come to us and say, 'Can you do a greater level of scrutiny?' I suspect there's going to end up being names of people that you want to know – names, aliases, addresses," Harvey said. "Since we use profiles for reservation booking anyway, you could create a series of profiles that end up getting red-flagged. That technology exists today. It would be just a matter of incorporating the profiles."

Hilton owns several hotel chains, including Hilton, Hampton Inn, Doubletree and Embassy Suites Hotels, as well as landmarks such as New York's Waldorf-Astoria and Chicago's Palmer House. All have been connected to the Hilton CRM system since spring 2000.

The only real obstacle would be privacy-related issues, Harvey said.

– Jennifer DiSabatino

Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement #0388697. CANADIAN POSTMASTER: Please return undeliverable copy to PO Box 1632, Windsor, Ontario N9A 7C9. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last two weeks in December by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 2001 by Computerworld Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased from the circulation department. Photocopy rights permission to photocopy for internal or personal use is granted by Computerworld Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base per-of $3 per copy of the article, plus 50 cents per page, is paid directly to Copyright Clearance Center, 27 Congress St., Salem, Mass. 01970. Reprints (minimum 100 copies) and permission to reprint may be purchased from Ray Tyniewich, Computerworld Reprints, c/o Reprint Management Services, Cloverleaf Corporate Center, 1611 Otis Homestead Lane, Lancaster, Pa., 17601, (717) 399-1900, Ext. 104, Fax: (717) 399-8900. Web site: www.reprintrb.com. E-mail: rtyt@reprintrb.com. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $5 per copy U.S. - $60 per year; Canada - $110 per year; Central & So. America: $160 per year; Europe - $295 per year; all other countries - $295 per year. Subscriptions call toll-free (800) 552-4431. POSTMASTER: Send Form 3579 (Change of address) to Computerworld, PO Box 512, Mount Morris, IL 61054-0512.

BPA ABM

FRANK HAYES/FRANKLY SPEAKING

Assembly Required?

BUY A REFRIGERATOR OR A DISHWASHER, and for a small extra charge, it will be delivered, unpacked, installed and made ready to use. Buy a new car, and the seller will tack on a "dealer prep" fee that pays for putting gas in the tank and oil in the crankcase and generally making sure it's ready to drive off the lot.

So why did it take until last week for Sun Microsystems to realize that "some assembly required" makes no more sense for servers and storage than it does for a kid's bicycle on Christmas morning?

Blame that old "do it yourself" IT spirit.

The idea behind the "Floor Tile Ready" program the company announced last week is that if Sun wires together a complete system at the factory, there will be fewer technical problems than if IT shop people put the system together themselves. Sun claims that among its Floor-Tile-Ready beta customers, "early life deployment issues" dropped from 2.5% to 0.5% of sites. Sun also claims installation time can drop from 10 days to one.

Are those numbers solid? Maybe, maybe not. But it makes sense that getting a vendor to integrate and test a system at the factory should mean installations take less time and have fewer problems than they once did. If the numbers prove out — and if the preintegrated systems are pretty close to what a particular IT shop needs — this could be a very good idea.

But will we seriously consider it? Unfortunately, mostly we won't. And we won't pass it up because of the cost, or the vendor involved, or limited choices that will be available in a program like this.

We'll ignore it because we want to do it ourselves.

We've mostly given up that approach when it comes to software. These days, we buy it off the shelf whenever possible — everything from PC desktop applications to IT shop tools. We've even replaced the old self-built Cobol systems that have run the business for decades with ERP packages.

And we don't diddle with the code in those canned applications. It's trouble enough configuring the software as it is, and there's plenty of real work for our coders to do.

But hardware is, well, *different*. We want to wire it together ourselves. We make up lots of excuses to justify that — we don't trust the vendor's quality control, we want to know exactly how everything goes together, we believe it's a good learning experience for the shop — but that's mostly baloney.

A new server smells new. It feels new. The connectors gleam, untouched by cables. The disks spin up clean, untouched by user passwords. *That's* the real reasoo we want to do this ourselves — it's like Christmas morning, fresh out of the box, and for a few days, we're once again kids with a new toy.

It's a great feeling.

But we can't afford it.

Really, we can't. Just like we can't afford the luxury of rewriting the code for our ERP systems. Just like we can't afford a two-year pipeline for new applications.

We can't afford to lose two weeks of staff time on other projects while we install a server ourselves. We can't afford the risk that we'll do something wrong and then have to call in an outside service organization to straighten it out. We can't afford to chew up all that time at the beginning of a server's life — when that server *should* be doing something useful for the business.

So run the numbers. See if it makes sense. If Sun's not your vendor of choice, push your preferred vendor to come up with a ready-to-use program of its own (HP has something similar, but not aimed at IT shops).

And if you really can't live without scratching that do-it-yourself itch, go buy a bicycle — the kind that comes in hundreds of pieces.

After all, there are only 64 more shopping days until Christmas.



FRANK HAYES, Computerworld's senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

COMPANY IS temporarily without an IT director, so senior tech pilot fish asks his boss, "What's the three-to-five-year plan for the IT department?" Boss shrugs. "You read all those periodicals. Whatever's in them, that's what we're doing."

AFTER THREE INCORRECT log-in attempts, this system automatically locks users out for 20 minutes as a security measure. But users balk at waiting so long before they can try again. So help desk pilot fish finds a new way to explain it: "I can unlock it, but it's going to take me 20 minutes. Go get some coffee while I work on it." Fish notes, "For some reason, they're happier with that."

TECH SUPPORT pilot fish walks new network admin through the basic installation procedure for a software package. Don't forget to mark these four files in the program's directory as read-only when you're done, fish says. After a pause, trainee asks, "I mark those files *after* I install the software, right?"

NEW DBA pilot fish discovers that backups of a mission-critical production database have never been tested. Testing on a production server is verboten. But when applications group boss sees the $30,000 price tag for a test bed system, he balks and asks, "Can't we just hope they'll work?"

CIO ASKS IT pilot fish to copy his 700KB PowerPoint presentation onto a CD. That's so small, it'll easily fit on a floppy, fish points out. No good, says CIO. "A CD is more appropriate for demonstration purposes to highlight our use of technology."

Highlight your tale: **sharky@computerworld.com.** You get a sharp Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky.*

The 5th Wave



"For 30 years I've put a hat and coat on to make sales calls and I'm not changing now just because I'm doing it on the Web from my living room."



BANDWIDTH AT YOUR FINGERTIPS

Yipes, the defining provider of optical IP services, will change the way you look at bandwidth. Our gigabit IP-over-fiber network lets you choose the bandwidth that's just right for your business. With up to 1 Gbps in 1 Mbps increments, you get the power you need, right when you need it. And since the Yipes network is IP and Ethernet throughout, you won't need any new equipment to tap into its robust bandwidth. Scalable, secure and super fast. That's the Yipes network.

Want to turn on the power? Check out www.yipes.com or call 877-7[illegible]-6600.

yipes™
that's fast!
Optical IP Networks

© 2001 Yipes Communications, Inc. All rights reserved. Yipes and Yipes that's fast! are trademarks of Yipes Communications, Inc. All others are properties of their respective holders.

Oracle Database Clusters
Unbreakable

Can't break it

Won't go down if your server fails.
Won't go down if your site fails.

Can't break in

14 International security certifications.
IBM DB2 has none. Even MS SQL Server has one.

ORACLE

oracle.com

Copyright © 2001 Oracle Corporation. All rights reserved. Oracle is a registered trademark of Oracle Corporation.
Other names may be trademarks of their respective owners.